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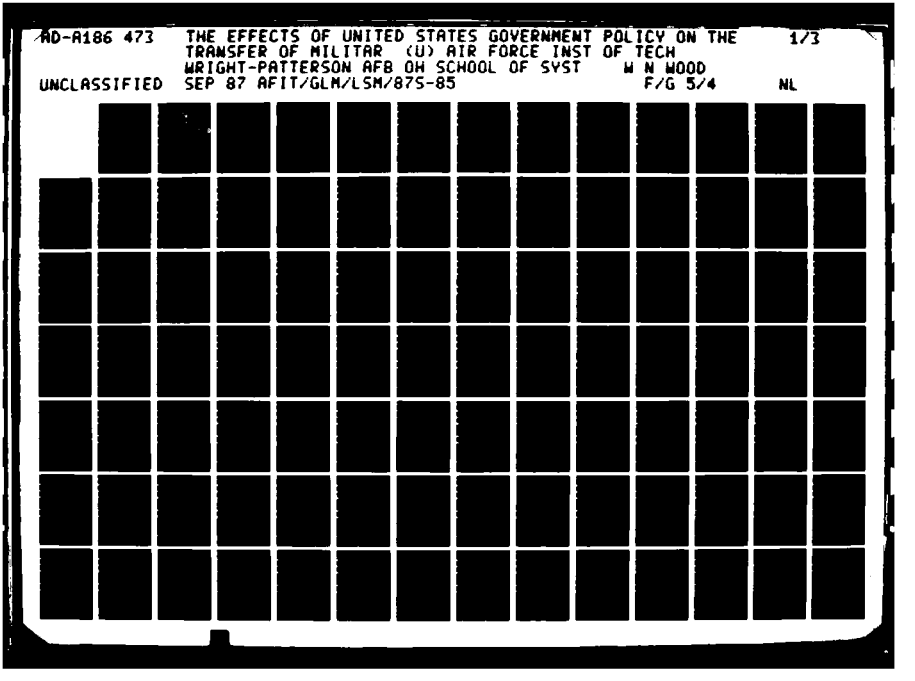

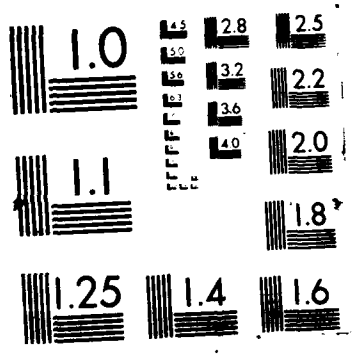
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THE EFFECTS OF UNITED STATES GOVERNMENT POLICY ON THE TRANSFER OF MILITARY TECHNOLOGY TO AUSTRALIA

THESIS

Warren N. Wood
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AFIT/GLM/LSM/87S-85

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THE EFFECTS OF UNITED STATES GOVERNMENT POLICY ON THE TRANSFER OF MILITARY TECHNOLOGY TO AUSTRALIA

THESIS

Presented to the Faculty of the School of Systems and Logistics
of the Air Force Institute of Technology
Air University
In Partial Fulfillment of the
Requirements for the Degree of
Master of Science in Logistics Management

Warren N. Wood, B.S.
SEO, Department of Defence, Australia

September 1987

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Abstract

The Australian Department of Defence experiences some difficulty in acquiring the necessary technical data to support defence equipment procured from the U.S. This study undertook to identify the key organizational players in the U.S. military technology transfer system; what difficulties arise for Australia when applying for the transfer of technology; the primary source of the difficulties; and why difficulties arise in the system.

The methodology was based initially on personal interviews, and an extensive literature review. A survey questionnaire was developed from an analysis of the information from the above two sources, to measure (on an interval scale) the difference in attitudes between U.S. and Australian officials concerning eight proposed constructs which were believed to underlie technology transfer issues.

The findings supported the global alternative hypothesis that there was a significant difference in attitudes between Australian and U.S. officials on policy matters concerning the development and implementation of the U.S. technology transfer policy. Six of the remaining eight sub-hypotheses were also rejected in the statistical analysis.

These findings supported to some degree the problems or difficulties identified in the system. These included general complexity of the policy and the technology transfer system; poor interaction between the participating U.S. Government departments; divergent views held by U.S. officials about key policy; de facto policy making by lower level officials; restricted technology transfer reviews undertaken for foreign military sales cases; divergent attitudes about the policy and its implication between U.S. and Australian government officials; and the classified nature of some critical U.S. technology transfer documents which are not releasable to foreign governments.

Recommended action to rectify the difficulties rests primarily on the shoulders of the Australian DoD. Principally, Australia should place more emphasis on examining aspects of technology transfer early in the project acquisition management phase, and fully develop justifications for desired U.S. technology. These actions would be enhanced by educating Australian personnel about U.S. technology transfer policy; the technology transfer system; and the process and its procedures. Recognition of these problems by U.S. decision makers may also bring about change in the system so that it accommodates more readily the transfer of technology to Australia and other allied nations.

THE EFFECTS OF UNITED STATES GOVERNMENT POLICY ON THE TRANSFER OF MILITARY TECHNOLOGY TO AUSTRALIA

I. Introduction

This thesis documents and analyzes the effects of United States (U.S.) policy on Australian requests for the transfer of military technology (defense applicable technology). The problems so far encountered by Australia when pursuing the transfer of military technology have not been insurmountable; however, as the Australian Department of Defence (DoD) continues to modernize its order-of-battle, the amount of U.S. sourced equipment and the level of its sophistication is increasing. Therefore, technology transfer issues will become a more important factor in the future acquisition of equipment, particularly as the Australian Defence Force (ADF) strives to become more self-reliant. To further complicate the issue, the unique nature of equipment required by the ADF can sometimes only be satisfied by procuring defense systems or technology from a number of overseas sources. Often the Australian DoD seeks to produce equipment under license in Australia which features U.S. designed platforms with subsystems from other countries, or U.S. subsystems incorporated into platforms from other western nations.

Problem Statement

Headquarters Support Command of the Royal Australian Air Force has reported difficulty in acquiring manufacturing data packages to support defence equipment procured from the U.S. (11:1). Manufacturing data packages (one of the many facets encompassed in the term intellectual property) primarily include essential technology which is fundamental to Australia's efforts to achieve effective long-term logistic support for, and licensed production of, U.S. weapons systems in Australia. The policy instrument which facilitates such transfers between Australia and the U.S. is the MOU on Logistic Support between Australia and the U.S. (see Appendix B).

United States policy and responsibility for its implementation rests with three primary departments--the departments of Defense, State, and Commerce. Additionally, the U.S. Customs Service accepts responsibility for enforcing regulations governing the export of technology. The very fact that policy and legislative responsibility is divested in so many agencies through such a complex set of legal instruments creates problems for both the U.S. Government and the Australian Government over technology transfer issues.

Research Objectives

The primary task of this thesis is to determine who are the players in the technology transfer system,

and what, why and where difficulties arise for Australia when attempting to transfer military-related technology from U.S. Efforts in this research concentrate on U.S. technology transfer policy. Concentrating on the policy is paramount because all exports of military-related technology (defense applicable technology) from the U.S. are governed by articles of U.S. law.

Research Hypotheses

The following hypotheses (research statements) were formulated from eight quasi-constructs (complex concepts). Each hypothesis shall be tested from empirical data collected by way of a questionnaire. The global research hypothesis is stated in H0 which is intended to determine whether there is a significant difference in attitudes between U.S. and Australian Government officials regarding U.S. technology transfer policy. Hypotheses H1 to H8 are designed to examine specific technology transfer issues that are related to testing the global research hypothesis.

H0: Overall attitudes concerning the U.S. technology transfer policy: There is no significant difference in attitudes between Australian and U.S. officials on policy matters concerning the development and implementation of the U.S. technology transfer policy.

H1: Australia/U.S. Defense Relationship: There is no significant difference in attitudes between Australian and U.S. officials on the value of the U.S./Australian defense relationship.

H2: Australia's Acquisition Strategy: There is no significant difference in attitudes between Australian and U.S. officials on Australia's policy for acquiring U.S. defense equipment.

H3: Implementation of the U.S. Policy on Technology Transfer: There is no significant difference in attitudes between Australian and U.S. officials on the implementation of the U.S. technology transfer policy.

H4: Australia's Need for Technology Transfer: There is no significant difference in attitudes between Australian and U.S. officials on Australia's requirement to transfer military-related technology from the U.S.

H5: Agencies involved in the Technology Transfer Process: There is no significant difference in attitudes between Australian and U.S. officials on the importance of the major organizational players in the technology transfer process.

H6: U.S. Technology Transfer Policy Documents: There is no significant difference in attitudes between Australian and U.S. officials concerning the importance of the various U.S. technology transfer policy documents.

H7: Australia's Status when Requesting the Transfer of Military Technology: There is no significant difference in attitudes between Australian and U.S. officials on the political status Australia receives when applying for the transfer of military technology.

H8: Problems for Australia when Requesting the Transfer of Military Technology: There is no significant difference in attitudes between Australian and U.S. officials on the importance of potential problems for Australia when seeking to transfer military technology.

One should note that these hypotheses were developed within the specific subject area of technology transfer, and not in the broad sense of government-to-government attitudes.

Investigative Questions

The basic foundation of the study is built around the history of U.S. policy on technology transfer, the technology transfer system, and the policy itself. Research relies heavily on an in-depth analysis of the most recent literature, apart from the statistical analysis of the data collected in the survey. Current information relating to each investigative question is presented in various sections of either the Background in Chapter II or in the Analysis of the Literature in Chapter III.

Each of the following investigative questions addresses a quasi-construct, which in turn lead to the statements of the test hypotheses H1 to H8. The number of each investigative question below corresponds to its counterpart quasi-construct and hypothesis. The discussion of the quasi-constructs is presented in the Chapter III, Methodology (see page 68).

1. Do both U.S. and Australian Government officials agree on the value of the U.S./Australian defense relationship?

2. What is Australia's policy with respect to acquisition of defense equipment?

3. Do the key Australian agencies understand the U.S. policy and its administration?

4. Do decision makers in key agencies in the U.S., understand the significance Australia places on the

issues of technology transfer, and therefore the provision of manufacturing data packages?

5. What departmental agencies (their structure and functional organization) respond to requests for technology transfer?

6. Which administrative instruments are used to manage the policy and the process of technology transfer?

7. With respect to the U.S. Government policy, is Australia treated differently because of the unique nature of its defense relationship with the U.S.?

8. What aspects of U.S. policy specifically cause problems for Australia when requesting the transfer of technology?

Scope and Limitations

The scope of the subject is deliberately broad so that the findings may be applied throughout the Australian DoD, and perhaps used as a guide for Australian industries involved in the maintenance, assembly, or production of military hardware of U.S. design. Knowledge of the Australian attitudes towards the U.S. policy may also be of benefit to U.S. decision makers when implementing policy which directly involves Australian approaches for the transfer of military technology.

While the scope of the subject is broad, the following three limitations provided a workable piece of

research within the time constraints of the masters course. First, the subject has already been limited by concentrating on issues concerning the government policies on technology transfer. However, the synergistic relationship between the policy and procedural aspects of technology transfer policy make it impossible to study one without the other in this thesis. Policy issues are paramount because of the legally binding nature of U.S. policy on all avenues of technology transfer, whether it be government-to-government procurement or Australian Government to U.S. defense contractor procurement.

Second, only a small proportion of the U.S. and Australian officers who might be involved in technology transfer policy issues were approached to participate in the research. The surveys were directed at officers at about colonel or colonel equivalent. Furthermore, those officers surveyed were drawn from a judgment sample. Both these factors may bias the results of the research which is a point of discussion in the Chapter IV (see page 86).

One final limitation is that a few anonymous sources of information were used to provide information on the functional mission statements of some newly created organizations within the technology transfer system. These officers asked not to have their statements attributed to them personally. While no particular reason

was offered, the author was obliged to accede to their wishes. The information gained from these sources is relevant to the discussion on organizational responsibilities presented in Chapter III.

Definition of Terms

A comprehensive list of definitions is contained in Appendix C (Glossary of Terms) to assist the reader. Where many of these terms appear in the body of the text for the first time, a simplified definition will immediately follow that term in parentheses. The reader should also note that all acronyms are expanded in Appendix A and may be further defined in the glossary of terms.

II. Background

Introduction

To establish the setting for this study, the reader is given a perspective of the Australian geography and its impact on Australia's Defence Policy, and an explanation of that policy. A brief discussion is also included on the nature of the defense relationship between Australia and the U.S. because defense alliances impinge on the development and implementation of U.S. policy on technology transfer.

Australia's Geographic Environment

Australia's geographic perspective is significant to the understanding of the objectives of this research. Australia's national strategic setting is significantly influenced by its geography and relative location, population size and distribution, and its national economic resources and infrastructure. The great majority of the population and the industrial centers are located in the southeast and the south of the continent (see Figure 1). The surrounding oceans and the massive tracts of inhospitable land to the north and northwest afford natural protection of these economically important areas in the southeast and the south of the continent. The manpower base is small, but the country possesses a relatively

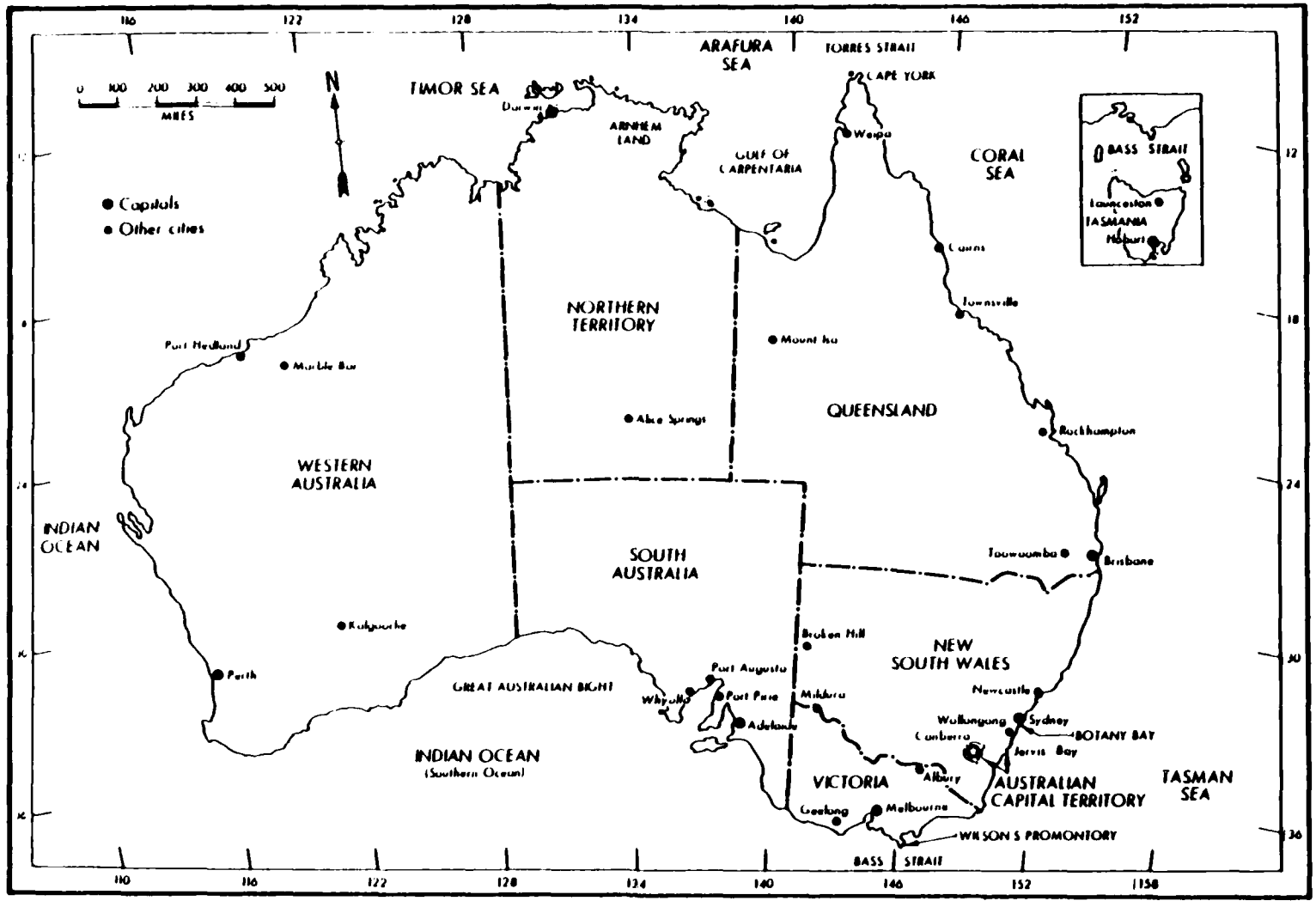


Fig. 1. General Geography of Australia [70:35]

large and sophisticated economic, scientific, technological and industrial expansion base. By regional standards, this gives Australia a substantial capacity to repair, support and develop its own defense equipment. The research base and the industrial infrastructure, however, cannot develop and manufacture at an economic cost the full range of high technology equipment which characterize contemporary defense forces (22:20). The location of the ADF facilities are determined by the defense policy but also impacted by the physical environment (Figure 2 shows the location of the ADF facilities).

The Australian continent has an area of 7,680,000 square kilometers and extends for 3,700 kilometers in a north/south direction and for 4,000 kilometers in an east/west direction. The coastline extends over 36,750 kilometers. The population of approximately 15.8 million is highly urbanized, with 86 percent residing in cities for which the populations are greater than 100,000 (44:43). A predominant area of the continent is arid and largely unpopulated, with the great majority of the populus residing in the humid east coast and southern regions (see Figure 3). As a comparison, the U.S. has a landmass area of 9,363,123 square kilometers with a population of about 237.2 million of which 73 percent live in urban areas (44:234).

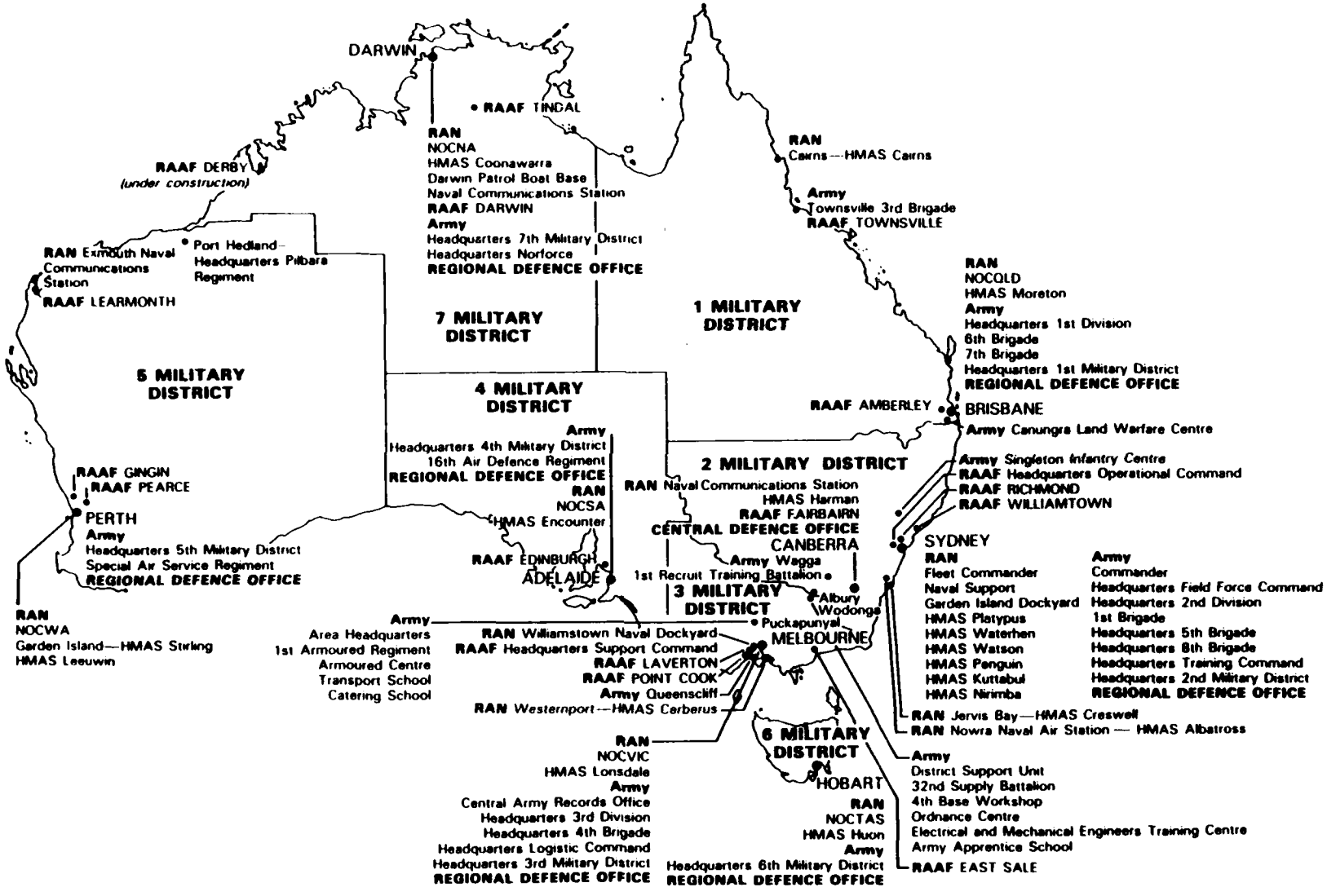


Fig. 2. Principal Australian Defence Force Facilities [23:35]

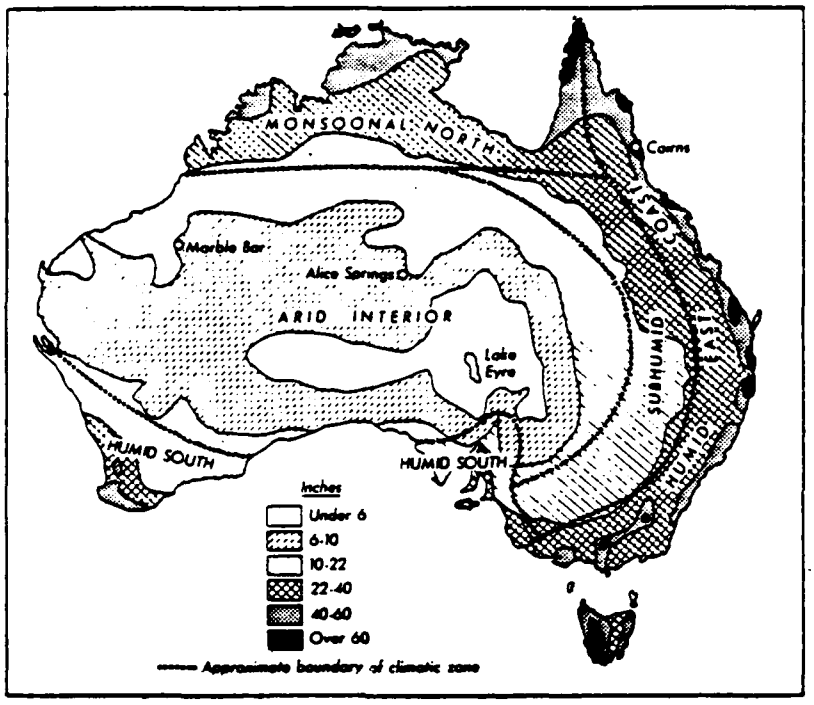


Fig. 3. Australia, Average Rainfall and Climatic Zones [70:43]

Australia's Defence Policy

Prior to World War II Australia was largely dependent on the British imperial might. Towards the end of World War II Australian sovereignty was directly threatened by Japan which was at a time when Britain was not able to provide support to Australia, so the government at that time turned to the U.S. for assistance. Australian forces were placed at the disposal of General MacArthur who successfully conducted Australia's defense as an integral part of the U.S. defense in the Pacific (37:23). After the war Australia, New Zealand and the U.S. ratified the Security Treaty (international political agreement) between

Australia, New Zealand, and the U.S. of America (ANZUS), which remains in force today.

In the last fifteen years Australia's strategic perspective has undergone some fundamental changes, particularly after Australia's withdrawal from Vietnam in 1970. Prior to that time, the defence policy evolved around a strategy under which Australian forces would operate well forward of the continent in conjunction with allied forces (37:23). By 1976 a new direction for Australia's defense policy became public in the Defence White Paper. The emphasis was on Australia's regional strategic interest (Asia and the Pacific) and a requirement for increased self-reliance. Australia being dependent only on U.S. military support in the event of a major threat to its security (19:6-11).

This new position was concomitant with the "Guam Doctrine" espoused by President Nixon which called on the allies to accept greater responsibility for their own security through increased self-reliance on their own defense forces. The need for this new approach was exemplified by the outcome of the Vietnam conflict, after which the U.S. recognized the dangers of projecting its military might over such vast distances. The policy of self-reliance has been echoed by successive U.S. Administrations. For example, the Dibb Report cites the major

policy statement in November 1984 by Secretary for Defense Casper Weinberger who said:

> We have learned that there are limits to how much of our spirit and blood and treasure we can afford in meeting our responsibility to keep peace and freedom. So while we may and should offer substantial amounts of economic and military assistance to our allies in their time of need, and help them maintain forces to deter attacks against them--we cannot substitute our troops or our will for theirs [37:23].

Having accepted the responsibilities of self-reliance, the Australian Minister for Defence, Mr. Kim Beazley, noted in an address to the Army Command and Staff College in 1985, that:

> . . . Government policy emphasises the need for a self-reliant strategic posture, based on the principle of developing independent national capabilities for the defence of Australia and its direct interests. There is no question but that the needs and priorities of this strategic posture must determine the development of our force structure [23:7].

Australia may appear strategically remote from areas designated as locations for likely nuclear conflict, but the Australian Government recognizes what a profound effect such a confrontation would have on Australia. The government believes it can be a constructive participant in international affairs to reduce the likelihood of a nuclear contingency (23:7). One avenue through which Australia can influence the international community is by its defense relationship with the U.S.

The Defense Relationship

The American alliance still remains the centerpiece of Australia's defense policy, a fact which was reiterated by Mr. Beazley when he tabled the 1987 Defence White Paper in the Australian Parliament on 19 March 1987 (6:1-10). The nature of the defense relationship between Australia and the U.S. is embedded in the ANZUS Treaty which was concluded in April 1952. The objectives of the Treaty are to:

> . . . declare publicly and formally their sense of unity, so that no potential aggressor could be under the illusion that any of them stand alone in the Pacific Area, and desiring further to coordinate their efforts for collective defence for the preservation of peace and security pending the development of a more comprehensive system of regional security in the Pacific Area [57:1].

As the Australian Government's 1983 review of the ANZUS Treaty found, ANZUS reflects to a large degree, a commonality in the strategic interests of the parties to the Treaty (5:20). This remains true despite the impasse between the U.S. and New Zealand over New Zealand's policy to ban visits by U.S. Navy nuclear powered or nuclear-capable ships to her ports. Trilateral activities between the parties have been reduced to bilateral interchanges between either the U.S. and Australia or Australia and New Zealand (23:9).

Under the umbrella of the treaty, there exist many fields of cooperation which benefit all the parties. It provides a basis for exchanges of views on strategic issues

and for combined exercises and a variety of training arrangements; assists with communications and exchange of intelligence assessments; facilitates and enhances cooperation in defense science matters; and enables cooperation in logistics (move and maintain forces) matters. The latter is central to the issues of this thesis. Policy matters concerning logistics, which include the aspect of technology transfer, are encompassed in the Memorandum of Understanding (MOU) on Logistics Support between Australia and the U.S. As the MOU states:

> The supply and support of the defence capability by the U.S. makes an important contribution to the capacity of the ADF for self-reliant combat capability and thus to the achievement of broad ANZUS interests in the region [49:1].

The ADF is equipped with a wide variety of advanced technology weapons systems of U.S. design and the uninterrupted support for these systems is vital to the effectiveness of the ADF. The MOU on Cooperative Logistic Support is a reciprocal arrangement which establishes the policies and guidelines for the provision of logistic support to the ADF by the U.S., and to the U.S. Armed Forces by Australia during both peacetime and contingent circumstances (49:1).

The support from the Australian defense industries is critical for the maintenance of defense, and to enable reciprocal logistic support to be provided to U.S. forces in contingent circumstances. Furthermore, the Australian DoD has a conscious policy, when selecting new equipments

for the ADF, to give more favorable consideration to the tender which offers the opportunity for licensed production in Australia. Acquisition policy is supported by the Australian Government Offsets Program which seeks to: "1. Establish internationally competitive activities within Australia, [and] 2. Support industry defence capability objectives" (20:3).

In short, intellectual property (managerial and technical knowledge) must be readily available from the U.S. so that the Australian defense industries and the DoD support facilities have the capability to provide the logistic support and the production capability necessary to achieve the Australian Defence Policy goal of self-reliance for the ADF.

III. Analysis of the Literature

Chapter Overview

This chapter presents the results of the literature review to establish the facts about the technology transfer system and process as it applies to this thesis. This analysis includes both documentary material and some information gained from personal interviews. Not only did both sources of information contribute to the findings of the study, but provided valuable guidance in establishing a clear definition of the problem; and played a key role in developing the quasi-constructs, and the survey instrument. Furthermore, this review assisted in substantiating the finding of the statistical analysis of the data collected in the questionnaire.

Introduction

Security is the cornerstone of the U.S. foreign policy. As former Secretary of State Henry Kissinger stated:

> Foreign policy must start with security. A nation's security is its first and ultimate responsibility; it can not be compromised or put at risk. There can be no security for us or for others unless the strength of the free countries is in balance with that of potential adversaries, and no stability in power relationships is conceivable without America's active participation in world affairs [43:204].

Furthermore, Rumsfield reports that in the Annual U.S. Defense Report for FY78 Kissinger maintained that one of the primary U.S. goals in today's interdependent world was to continually strengthen the bonds between the allies who share our traditions, values and interests (55:4). Ultimately the thrust of the U.S. foreign policy is met by the provisions of security assistance (defense assistance) which includes the transfer of defence material, technology, services, training, and economic aid (18:1-5).

> As a consequence of this proactive U.S. policy . . . international transfer of technology vice transfer of goods and services and munitions is becoming a more widely requested and used method for providing security assistance and for providing cooperative arms production and distribution among nations with common defense objectives [17:7-1].

Unfortunately, a conflict exists over the U.S. policy to promote international trade, designed to enhance the competitive nature of the U.S. industrial base while on the other hand there is the need to restrict access to the technology to undesirable nations. This constraining policy is that of technology transfer which is designed to restrict the export of goods, services, munitions, and complete weapons systems which may be detrimental to the national security of the U.S. (17:7-1).

Despite having arguably the broadest technologically advanced industrial base in the world, the U.S. recognizes that collectively the allies have an industrial base comparable with its own. Increased cooperation with

the allies is viewed as a method of optimizing the combined resources by raising the level of combat effectiveness and increasing efficiency in the use of those resources (17:7-3). This policy of cooperation fulfills the objectives of the trade policy and, goes hand-in-glove with the broader defense policy that the allies become more self-reliant with respect to their own security. Furthermore, cooperation with allies affords the U.S. DoD a second source of production, and access if necessary to host-nation logistic support and industrial infrastructure. Such access contributes to raising U.S. force readiness in both peacetime and during contingent circumstances.

To optimize allied force effectiveness and the efficiency of their industrial base, the U.S. has an established policy asserting the importance of rationalization, standardization and interoperability (RSI), principally with its North Atlantic Treaty Organization (NATO) partners (65:Section 803(b)). However, the objectives of RSI are also being pursued and achieved with other nations including Australia (18:7-3).

The approach to be adopted in accomplishing these objectives of RSI is set out in DoD Directive 2010.6 on "Standardization and Interoperability of Weapons Systems and Equipment within the North Atlantic Treaty Organization." They are:

1. Establishment of general and reciprocal procurement MOU with NATO member nations to encourage bilateral arms cooperation.

2. Negotiation of coproduction/dual production of developed or nearly developed weapons systems to permit other NATO countries to undertake production of identical systems.

3. Creation of families of weapons (program packages) for systems not yet developed to coordinate and share research and development [17:7-5 and 31:1-3].

Achievement of these objectives may require the negotiation of offset agreements to reduce the burden of expenditure and to balance trade. The principle objective of this approach is to introduce the latest technology into the allied forces at the least cost in terms of money and resources (17:7-7). The Arms Export Control Act (AECA) of 1976, as amended, governs these programs in terms of the guarantees given by the U.S. Government for production outside the U.S. (64:Sec 42(b)).

Technology Transfer Defined

Within the scope of this study, technology transfer is broadly defined as the process of transferring technical data (significant military technology) from industry in the U.S. to industry or to government agencies in other countries. Technology is broken out into two categories--that of military and dual-use technology. While military technology is the focus of this research, often dual-use technology is incorporated into military systems, such as computer software and hardware, and electronics. Thus, for the purpose of this research the terms military

technology or military-related technology refers to technology solely designed for defense application and used in defense equipment, and commercial technology which may be incorporated into defense systems or utilized as defense equipment in its own right.

Varying amounts of classified and unclassified military and dual-use technology comprise all significant military equipment, and the numerous subsystems and major components which constitute that significant military equipment. The classification of military technology dictates the criteria used to assess each request for transfer. Policy guidance is primarily contained in the International Traffic in Arms Regulation (ITAR), and the National Disclosure Policy (NDP) while the implementing regulations are contained within numerous U.S. DoD and Service Security Publications (for a detailed list of these publications readers are referred to 18:7-26).

Military-related technology is regarded as a valued national asset which is not to be transferred to any country unless that transfer meets certain criteria established by the U.S. Government. Transfer of technology relating to defense articles and services can not be accomplished without issuance of an export license from the Department of State in concert with the U.S. DoD. The license is granted in compliance with the AECA, and the ITAR. In the case of dual-use technology incorporated

into military systems, export licenses are issued but in accordance with the Export Administration Act (EAA) of 1979, as amended in the Export Administration Amendments Act of 1985. Determinations concerning dual-use technology licenses parallel and comply with Coordination Committee for Multilateral Export Controls (COCOM) guidelines. If national security or foreign policy is of concern the Department of Commerce refers these license issues to DoD and Department of State respectively (53:3-7).

History Behind the Technology Transfer Policy

The vast outpouring of significant technology to the Soviets of either direct military technology or dual-use technology since the early 1970s has been the driving force behind the policy. Soviet motivation to acquire Western technology was driven by a need to reduce the technological gap in their industrial base. Soviet weapons were traditionally based on designs which were adaptable to labor-intensive factories and simplistic enough to be readily maintained in the field with the minimum of technical skill. Based on lessons learned from past performances in battle, the Soviets have recognized the need to develop more technical complex systems (30:2).

Since 1982 it has become clear that the Soviets have two programs to acquire Western technology. First, they have a program to raise the technical levels of

weapons and military equipment in conjunction with improvements in the associated manufacturing processes. Second, they administer a trade diversion program to acquire dual-use technology and equipment which can be applied to their production lines (30:2).

The Soviets obtain this technology illegally through classical espionage techniques and by evading export controls by diversion, retransfer and dummy companies (35:72). Several sources can be found which discuss these activities. Particular cases can be cited in both the "Soviet Acquisition of Military Significant Western Technology: An Update," and the article in the Department of State Bulletin which highlight the seriousness of the problem.

In the early 1970s a task force was commissioned to examine the implication of the technology exports on U.S. defense (referred to as the Bucy Report). At the conclusion of the review a memorandum from Mr. Bucy to the Chairman of the Defense Science Board summarized aspects of the report when he stated:

> . . . it is design and manufacturing know-how that impacts a nation's capability . . . beyond the limitations of current laws, regulations, and practice a new approach to controlling technology exports is overdue. . . . The Task Force urges that the Department of Defense take the lead in formulating policies that will enable other government agencies to control the export of critical technologies effectively [10:iii-iv].

The report did not go unheeded; several of the recommendations were implemented. For example, the report suggested a list of critical processes and key manufacturing equipment (10:xv) which is now manifested in the Military Critical Technology List (MCTL). Establishment of the Defense Technology Security Administration (DTSA) in 1985, as the focus for DoD policy and export licensing was probably a result of the principal finding of the report. Current and proposed modifications of the technology transfer system appear to be closely paralleling other recommendations of the Bucy report.

Critical Technologies

Critical technologies, those which contribute to developing military hardware targeted by the Soviets, are technologies which attract the highest level of scrutiny within the technology transfer review process. Direction of the aggressive Soviet technology acquisition program can be summarized under five categories: microelectronics; computers; command, control, communications and intelligence; computer-integrated design and manufacturing; and material fabrication (30:29).

THE MCTL assists the DoD to achieve its technology transfer goals by focusing attention on appropriate militarily critical technologies. The MCTL is not a control list but a reference manual to aid DoD decision

makers in developing export licensing and technology transfer policy, and assist in evaluating COCOM, Commodity Control List (CCL) and ITAR proposals (28:2).

Concerns of the United States Government

The fundamental reason for controlling the transfer of technology is to maintain the West's military technology advantage. Should that advantage not be maintained the western nations would have to compete with the Soviet Bloc man-for-man and gun-for-gun (46:2).

The primary concerns of the U.S. Government are four-fold. First, the fruits of long-term investment in research and development are jeopardized should an adversary acquire critical technology (key technology and processes) early in the development or test cycle of new equipment. Second, the altering relationship between military and civilian technology leaves the U.S. technological advantage vulnerable. More and more military systems are incorporating technologies freely available in the marketplace. Third, the determination to make available advanced technology to NATO, means multilateral agreement, and mutual agreement between the partners which severely slows the pace of modernization, thereby allowing the Soviets the time to narrow the technological gap. Fourth, the Soviet's program to acquire advanced western technology is huge (46:2-3). The U.S. has wrestled with these

concerns and the national security and trade objectives to develop their policy.

United States Technology Transfer Policy

The introduction to this chapter centered on the important issues of the desired defense policy, its history, and the pursuits of international trade objectives, but the critical issue is how to continue these policies and at the same time deny access to military significant technology by the Soviet Union and the Warsaw Pact.

Ralph Sanders stated the situation succinctly:

> Technology now plays a critical role in assisting the U.S. to meet its security needs. Often viewed as the "strong suit" of U.S. military preparedness, technology has been called on to meet the challenge of growing Soviet military might [47:4].

President Reagan's Policy. Since the Truman Doctrine was proclaimed in March 1947 (see summary in 17:1-12,1-13) the policy on arms transfer has generally been static. In July 1981 President Reagan announced the new Conventional Arms Transfer Policy which was a more pragmatic view of security assistance as opposed to the Carter Administration perspective where arms transfers were an "exceptional foreign policy implement" (18:1-24). In essence, Reagan espoused that the U.S. could not alone defend the western security interest. But with support to friend and allies through security assistance this defense need could be met. Emphasis of this national

policy is to encourage conventional arms transfers and coproduction arrangements to help strengthen allied military and industrial capabilities, thereby fostering regional and U.S. national security objectives. One of the major vehicles for achieving this policy is the exploitation, by allied nations, of emerging technologies, most often from America (46:3).

Department of Defense Policy. In view of the Soviet acquisitions of U.S. technology that were revealed in the late 1970s and early 1980s, President Reagan wished to enhance the security policy toward strategic trade. This meant tighter export controls while at the same time not hindering U.S. commercial activity, or seriously denying access to vital technology by allied nations. Secretary of Defense Casper Weinberger instigated the Technology Security Program to address the security policy aspects of strategic trade by reorganizing DoD, that gave rise to the establishment of DTSA. Aspects of the reorganization were embodied in DoD Directive 2040.2. This directive on the "International Transfer of Technology, Goods, Services, and Munitions," focused on the program goals, the responsible agencies, and their respective missions. It coalesces policy, operational and technical personnel throughout DoD to provide support to the Departments of State and Commerce with national security recommendations

on technology transfer (62:4-5). The controls for the transfer of technology enunciated in the policy are such that:

> . . . It shall be DoD policy to treat defense-related technology as a valuable, limited national security resource, to be husbanded and invested in the pursuit of national security objectives. Consistent with this policy and in recognition of the importance of international trade to a strong industrial base, the Department of Defense shall apply export controls in a way that minimally interferes with the conduct of legitimate trade and scientific endeavor. Accordingly, DoD Components shall:
>
> 1. Manage transfers of technology, goods, services and munitions consistent with U.S. foreign policy and national security objectives.
>
> 2. Control the export of technology, goods, services and munitions that contribute to the military potential of any country or combination of countries that could prove detrimental to U.S. security interests.
>
> 3. Limit the transfer to any country or international organization of advanced design and manufacturing know-how regarding technology, goods, services, and munitions to those transfers that support specific national security or foreign policy objectives.
>
> 4. Facilitate the sharing of military technology with allied and other nations that cooperate effectively in safeguarding technology, goods, services and munitions from transfer to nations whose interests are inimical to the U.S.
>
> 5. Give special attention to rapidly emerging and changing technologies to protect against the possibility that militarily useful technology might be conveyed to potential adversaries before adequate safeguards can be implemented.
>
> 6. Seek, through improved international cooperation, to strengthen foreign procedures for protecting sensitive and defense-related technology.
>
> 7. Strive, before transferring valuable defense-related technology, to ensure that such technology is shared reciprocally [27:2].

Legislative and Policy Controls. While this policy directive may appear to be straightforward, the complexity

of the technology transfer issue only becomes apparent when the number of overriding statutory regulations and Acts are considered. Principal among these are the EAA, the AECA, the ITAR, and the NDP.

Export Administration Act. The EAA is the principal authority for controlling commercial technology exports in noncontingent circumstances, and it is the linchpin for most other export controls. The power to issue export licenses is vested in the Secretary for the Department of Commerce. Under this Act controls are considered in the context of the national security and foreign policies. EAA's national security policy authorizes control on military technology, although the AECA specifically regulates the export of military technology (66:Sec 5). Thus the EAA's national security control measures are mainly directed towards dual-use technology (53:3).

Exports of dual-use technology are controlled by the issue of export licenses, in accordance with the Export Administration Regulation, which are authorized by the U.S. Department of Commerce, Office of Export Licensing (OEL) (61:208). Export licenses for dual-use technology incorporated into military systems require that the OEL obtain interagency approval within the U.S. Government (66:Sec 5(a)); and, unanimous COCOM approval where export

licenses involve embargoed technology bound for proscribed destinations (32:35).

Within the EAA, export of technology is considered with respect to the CCL, the Munitions List and the Nuclear Control List. The specific link between the EAA and the AECA comes through the MCTL which is developed by the DoD and forms part of the CCL (67:Sec 106).

Arms Export Control Act. The AECA authorizes the control of the export of defense articles and services in pursuit of world peace, and the furtherance of U.S. national security and foreign policy objectives. Military technology, like defense hardware, is subject to the AECA, and before the transfer of either occurs an export license must be issued in accordance to the ITAR. This Act explicitly controls technology that is specifically listed in the Munitions List (the Munitions List is Part 121 of the ITAR which shall be discussed below). The AECA controls both government-to-government and commercial-to-foreign government transaction for the transfer of technology. Where the commercial export of technology is being sought, a license must be issued by the Department of State, Office of Munitions Control (OMC). In government-to-government cases OMC obtains the DoD concurrence.

International Traffic in Arms Regulation.

The AECA licensing system is captured in the ITAR. The ITAR is the regulatory code for licensing exports of defense articles and services which also includes the transfer of technology or technical data. The general policies and provisions are contained in Part 126 of the regulation. Segments of the ITAR that are of particular interest to this study are:

> Part 126. Section 126.6 allows the transfer of classified or unclassified technical data without a license from the OMC provided the relevant diplomatic mission is registered with the OMC, and that a Letter of Offer and Acceptance has been executed and accompanied by a properly completed Department of State Form DSP-94 [68:369].
>
> Part 125. This part of the ITAR describes the policy and procedures for the export of technical data and classified defense articles and services. Section 125.3 establishes that a request for the authority to export defense articles and technical data must be submitted to the OMC. Although this may be waived if the recipient country has ratified a General Security and Information Agreement with the U.S. In Australia's case such an agreement has been concluded. The transmission of the technical data must satisfy the requirement of the DoD Industrial Security Manual [68:364].
>
> Part 124. This part specifies that manufacturing license agreements and technical assistance agreements must be approved by the OMC but if additional classified technical data is required in furtherance of an already approved agreement, no further approval is necessary [68:357].

Government-to-government transactions for the transfer of military technology are normally conducted as Foreign Military Sales (FMS) cases which are administered by the DoD under policy guidance from the State Department.

Authority to transfer responsibility for FMS cases from the State Department to the DoD is codified in Section 126.6 of the ITAR (68:369). Foreign military sales are authorized in accordance with the Foreign Assistance Act of 1961, as amended, the AECA and the ITAR itself; and conducted within the policy framework prescribed in DoD Directive 2040.2 on the International Transfer of Technology, Goods and Services and Munitions. Specific details of the transfer are negotiated within the Letter of Offer and Acceptance on form DD-1513 as the contractual instrument between the U.S. and the recipient government (68:369-370). Should Australia decide to acquire defense equipment and technology direct from a U.S. defense contractor rather than through FMS, that contractor must apply to the OMC for an export license.

National Disclosure Policy. The NDP is the critical document which enunciates the controlling policy and regulations which refer to classified material, technology, and training. Classification, however, may not always be directly related to the technology content. The NDP reinforces the concept of technology being a U.S. national asset that can only be shared with foreign governments who provide adequate security measures to protect critical technology. The prominent feature of this policy is that disclosure must have clear advantages for the U.S.

Applications for the release of classified military technology must meet the following five policy criteria relating mainly to aspects of national and physical security (18:7-21 to 7-22).

> 1. Disclosure must be consistent with U.S. foreign policy regarding the particular nation or organization in question.
> 2. Disclosure must not present a serious military risk to the U.S. This entails assessing the technology level and sensitivity of the proposed disclosure.
> 3. Disclosure can be sufficiently protected by the receiving country or organization. Recipients must have both the capability and the intent to protect the security of U.S. information.
> 4. Disclosure must benefit the U.S. These benefits must be at least as valuable as the information disclosed.
> 5. Disclosure is limited to only that information required to accomplish the job [18:7-21 to 7-22].

Technology Transfer Case Criteria. In closing this section on the legislative controls, it is appropriate to comment on criteria upon which technology transfer cases are judged. These criteria stem from the policy documents discussed above. While broad in nature, the following individual questions or criterion represent a general area of responsibility for particular elements within DoD.

1. What impact will the transfer have on national security objectives (27:3)?

2. What would the impact be on U.S. military operational capability if the technology became available to the Soviets (27:2)?

3. Could the inadvertent disclosure of the technology to unauthorized government potentially reduce the U.S. technology leadtime over the Soviets (27:3)?

4. What is the classification of the technology and does its release comply with NDP, DoD Directive 5230.25 (27:4; 26:1; 32:1)?

5. Does the recipient country have sufficient security provisions in place to protect the technology? This would be based on the existence of a General Security Information Agreement (18:7-22; 68:364).

6. If the recipient nation is not a member of COCOM have they enacted similar legislation to control reexports (27:5)?

7. Technically evaluate the technology with respect to the Military Critical Technology List (28:2).

8. Will the transfer result in tangible and direct benefits to the U.S. and be at least equivalent to the value of the technology transferred (27:3; 18:7-21)?

9. What is the nature and extent of the defense relationship with the recipient nation?

10. Will the release of the technology be in accordance with established DoD policy?

11. What benefits will the technology afford the military of the recipient country (18:5-10 to 5-22)?

These board criteria are considered by the various elements of DoD when particular cases on technology transfer are being reviewed, or where policy issues need to be resolved. The technology transfer system itself, and the important players in that system are dealt with in the following section.

West-to-west Military-related Technology Transfer System

West-to-west technology transfer refers to technology transferred to free world nations (32:34). From the preceding discussions, intuitive thought, and the arms transfer models developed by Chipman and Cunningham (12), the broad technology transfer system and its environment are comprised of three subsystems which have redundant relationships. These subsystems are based upon the division of responsibilities vested in the Departments of Commerce, State and Defense. Theoretically, the reliability of the system is greatly enhanced by redundancy but at the expense of increased manpower, costs, time, and flexibility. The objects or the elements of the system, and its environment are illustrated in Figure 4. Briefly, the objects are the inputs, the transformation process and the outputs (56:13-24). Inputs may be summarized as Australia's desire for technology, the application for technology transfer, and the availability of the U.S. technology. Inputs may enter the system through either

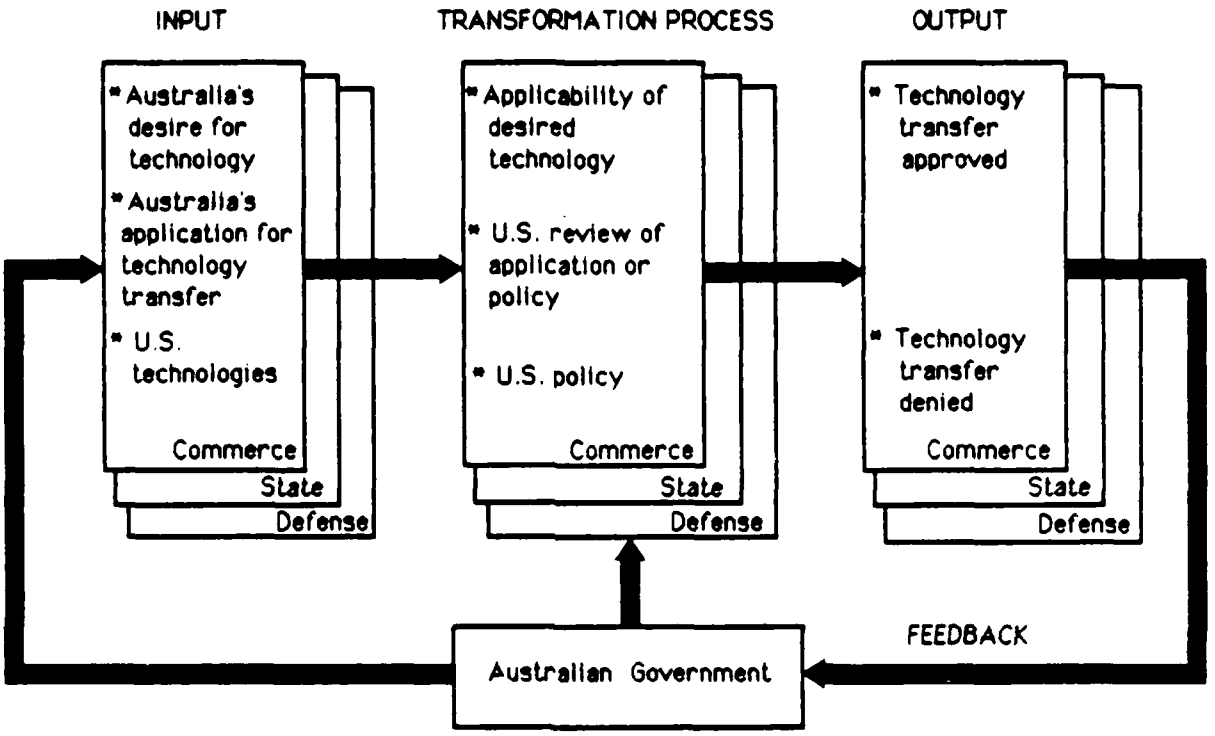


Fig. 4. West-to-west Military-related Technology Transfer System and the Environment (Adapted from 56:22 and 12:23-64)

of the three subsystems and proceed into the transformation process. The process involves the applicability of the desired technology to the needs of the recipient nation, U.S. review of the application within each subsystem, and finally, the U.S. policy on technology transfer. After review, the output is either an agreement or a denial to transfer the desired technology.

Critical to the operation of the system are the environmental factors. International politics involving current diplomatic relations impact the system (12:23-64). In 1987 this was brought to prominence by the discovery that critical Japanese technology had been transferred to the Soviet Union (14:40). In view of the Japanese transgression, the U.S. considered whether tough political actions against Japan were warranted. Thus the international political climate vacillates in reaction to this type of situation and other events in foreign relations.

The status and type of international agreements also have an effect on technology transfer policy. For example, parties to defense treaties such as NATO and ANZUS are considered more favorably than those nations not party to these agreements. A fact highlighted by particular reference to aligned nations in the four principal technology transfer documents cited on page 23. The nations who illegally receive technology are the targets of the U.S. policy. Evolutionary changes in the policy are

based upon the success or otherwise of the Warsaw Pacts' acquisition of U.S. technology. The plethora and speed of technological developments create considerable uncertainty in the system, largely because of the inability to maintain complete knowledge of all those technologies critical to defense needs. The vast array of technology and the aggressive Soviet acquisition program through the multitude of transfer mechanisms (methods of acquiring technology) contributes significantly to the uncertainty of the environment; therefore, making management of the technology transfer system difficult.

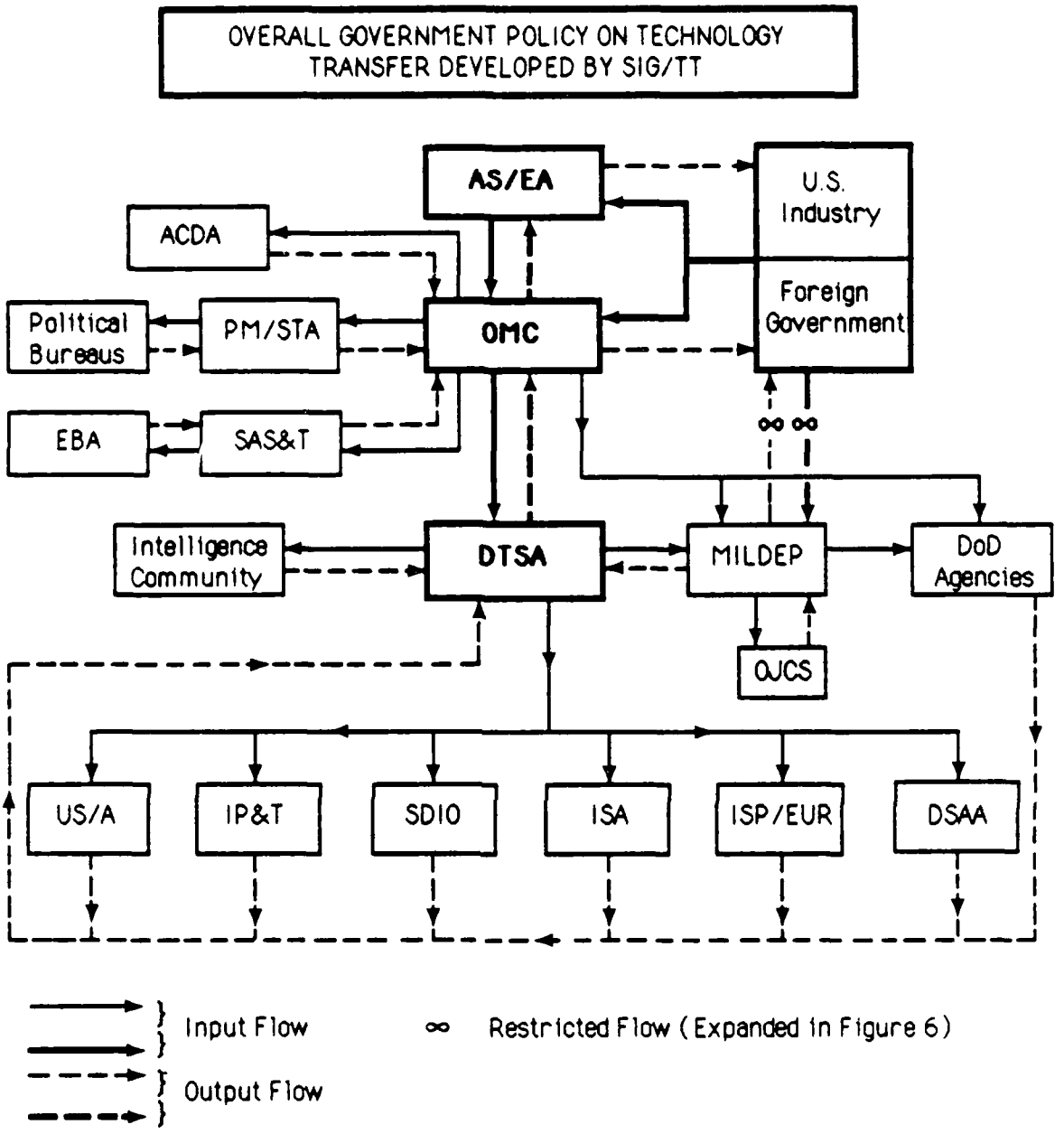
The environmental factors discussed are by no means complete, but the dynamics of the technology transfer system and the very nature of the environmental factors demonstrate how uncertain the total system environment can be. To combat these uncertainties the role of the information scanning is critical. This function is chiefly performed by the U.S. intelligence community and various other elements in the Departments of Commerce, State, and Defense. Each conduct the classical surveillance and searching operations of viewing, monitoring, investigation and research (69). The heightened awareness of these agencies has contributed to improving U.S. management of the technology transfer system (32:24).

In this study, the system of military technology transfer involves both policy, and policy implementation

(case-by-case reviews) aspects of technology transfer. While some purists might argue that a technology transfer policy system exists independent of a policy implementation system, there is little doubt that the effects of U.S. policy on Australia, or any western nation, must be an interaction of both systems. That interactive system is represented pictorially in Figure 5.

Access to the System. Access to the military-related technology transfer system is governed by two criteria; first, the type of technology (that is either military and dual-use); and second, from whom the request to transfer is received. Foreign governments may apply for the transfer of military-related technology in two ways. First, by seeking to procure technology directly from U.S. industry, that company must apply for the transfer (68:367). Second, in the case where the technology being acquired is the property of the U.S. Government or the property of a U.S. company, but purchased under as a FMS case, the foreign government must apply directly to the U.S. Government for the transfer (18:8-1).

In the first instance, an approach for the transfer of technology by U.S. industry must be directed to the OMC if it is for technical data which relates to defense articles on the Munitions List as defined in the ITAR (32:33; 68:335). When items fall outside the ambit of



Note: This diagram relates to the formal connectivity of the elements only, and it is not representative of tome. Flows to multiple organizations are sometimes achieved concurrently through electronic communications or duplicate paperwork.

Fig. 5. West-to-west Military-related Technology Transfer System (32:33; validated by Defense Industry Attache, Australian Embassy, Washington DC)

the ITAR (that for dual-use technology), U.S. industry must refer the application to the Department of Commerce (sometimes industry may unknowingly direct the request to the OMC). Department of Commerce concurrently notifies OMC and DTSA of the request and seeks their respective department's position concerning the application to transfer the technology. Department of Commerce, OEL will be responsible for issuing the export license.

The second approach is when Australia or any other western nation makes application to the U.S. Government for the transfer of technology through their respective diplomatic missions in Washington DC. These cases may be subdivided into three categories: dual-use, military non-FMS, and FMS.

In the first category, requests for dual-use technology will be directed, as before, to the Department of Commerce and coordinated as would an application by U.S. industry.

For category two, a country may apply for the transfer of military technology which is not related to a specific FMS case. In these instances the respective diplomatic mission may approach either OMC (18:7-39) or the cognizant component of DoD who is the designated owner of that technology. Unfortunately, no literature could be found to determine how such cases are handled. However, should a request be directed to OMC it is most

likely referred to DTSA for approval. Where the approach is directed to the DoD it is probably handled in a similar manner to category three cases.

In a category three case, when a country is acquiring defense equipment under a FMS case in accordance with the ITAR and the AECA, the transfer of the accompanying technology is implied through the request to acquire the equipment itself. Foreign missions will approach the respective military department who provides the FMS program management function for that FMS case. Therefore, the U.S. review of a country's proposal for military equipment and the associated technology is initially forwarded to the cognizant Military Department (18:8-1 to 8-11). Coordination of the proposal is conducted through the channels defined in Figure 6. As illustrated, action rests primarily with the Military Department with information sought from the Bureau of Politico-Military (PM) Affairs and Defense Security Assistance Agency (DSAA) (18:8-2). Despite the pivotal role in coordinating the Technology Security Program, DTSA does not appear to be involved in FMS cases which obviously address technology transfer issues. Instead, it appears that in these instances the departmental position is formally developed by the cognizant military department in isolation of the remainder of DoD.

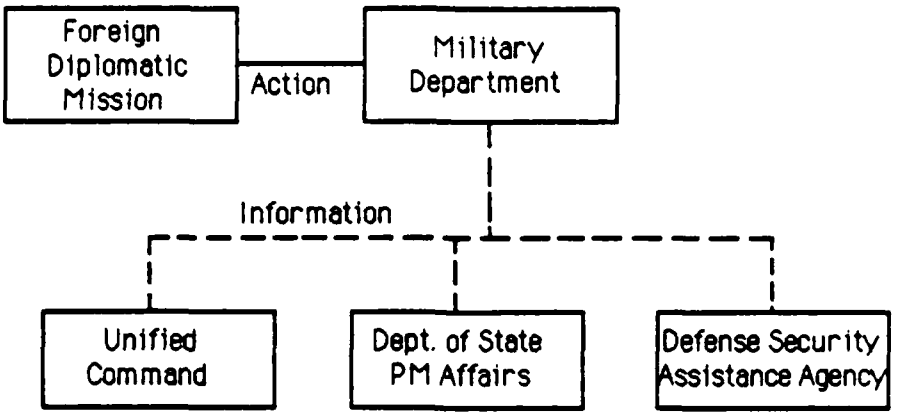


Fig. 6. Restricted Technology Transfer Action for Foreign Military Sales Cases (18:7-3)

Major Organizational Roles in the System. Responsibility for technology transfer is a trilateral function of three government departments--Departments of Commerce, State, and Defense with DTSA being the focal point within the military-related technology transfer system. Figure 5 represents the formal relationships between and within departments and agencies. Informal interactions are also an important aspect of the system, particularly in DoD where so many organizational elements contribute to the process.

Before expanding the discussion on the role of the individual agencies and departments, it is worth understanding that intradepartmental and interdepartmental committees are utilized to develop cohesive policies and decisions on technology transfer matters. Policy development does not reside with any one department or agency.

Instead, committees such as the Senior Interagency Group on the Transfer of Strategic Technology (SIG/TT) determine policy on behalf of the U.S. Government. The chairperson is the Special Representative for Strategic Technology Affairs who represents the Secretary of State. Apart from heading SIG/TT, the Special Representative for Strategic Technology Affairs coordinates and develops a singular State Department voice on related technology transfer matters, and represents the department at senior levels before such bodies as COCOM and the National Security Council. An executive secretariat for the SIG/TT operates in the newly created Office of the Special Representative for Strategic Technology Affairs.

The Department of Defense has formally instituted the International Technology Transfer (IT^2) Panel to identify important policy issues and resolve intradepartmental differences concerning the Technology Security Program administration, differing interdepartmental positions, and coordination of DoD positions on particularly important cases (27:2-1).

The Operating Committee is the first step in the interagency review process which works to resolve contentious export applications. Usually only important cases involving militarily significant exports are referred before such committees. They have a tendency to be

precedent-setting and as a consequence influence proceeding cases (61:212).

The number and frequency of these intradepartmental and interdepartmental committees is difficult to gauge given that only a few are well documented; but their chief purpose is to reach agreement on major export issues (32:37).

Department of Commerce. Within the Department of Commerce, the Under Secretary for International Trade, through the Deputy Under Secretary for Export Administration, administers the EAA with respect to dual-use technology exports, and coordinates the U.S. activities with COCOM. These functions are achieved within the Offices of Technology and Policy Analysis, Foreign Availability, and Export Licensing (13:1; 61:208). Concurrent coordination occurs between Commerce, State and DoD when license applications have either foreign policy or national security implications, respectively. The offices within the Export Administration have undergone expansions and automation since 1985 to cope with the increased case review activity (61:208).

Department of State and Related Agencies. Policy actions and technology transfer case implementation which involve matters of foreign policy are referred to the State Department. The Bureau of Politico-Military Affairs

oversees technology transfer matters by providing policy guidance on arms control issues and maintains liaison with DoD and other agencies (52:401). Within PM, the Office of Munitions Control has the delegated authority to administer the U.S. Government program for control of commercial exports of defense articles, defense services and related technology which appear on the Munitions List (68:335,337; 36:4). The Office of Munitions Control may seek comments on specific cases or policy direction from either the Office of Strategic Technology Affairs (PM/STA), or specific country advice from one of the regional geographic Political Bureaus (52:399). The Office of Strategic Technology Affairs is responsible for the principal State Department policy on technology transfer matters. This office liaises closely with the Special Representative for Strategic Technology Affairs who makes specific recommendations on sensitive or important cases and ensures military implications of the proposed exports are fully appreciated in the decision-making process (36:4).

Within the State Department, the consultation process also captures the organization of the Under Secretary for Security Assistance and Science and Technology (SAS&T). This office integrates all the elements of the Foreign Assistance Program into an effective instrument of foreign policy that encompasses matters of international scientific and technology issues, including technology

transfer (52:398). Australian efforts to transfer technology through FMS come under the purview of the organization.

Finally, the Bureau of Economic and Business Affairs (EBA) is responsible for formulating and implementing foreign and economic policy and also provide input on international technology transfer matters (52:400; 34:7).

The Arms Control Disarmament Agency (ACDA) assists the Under Secretary SAS&T in advising the Secretary of State on arms transfer and security assistance matters (60:91). The agency participates in formulating and implementing U.S. policy on the transfer of conventional arms and military-related technology. Their role is conducted within the framework of the President's Conventional Arms Transfer Policy of July 1981. Within the agency the Bureau of Nuclear and Weapons Control, the Arms Transfer Division, assesses the impact of technology transfer involved in proposed arms sales (60:89,120).

Department of Defense. This department reviews approximately 20 percent of the export license requests submitted to OMC (32:31). The Defense Technology Security Administration is the focal point of DoD's efforts to ensure that international transfers of military-related technology, goods, services and munitions adhere to U.S.

national security and foreign policy objectives. Its organization and coordinating role are detailed in DoD Directive 2040.2 which emphasizes the relationship between other pertinent DoD offices described in Figure 5. The mission of DTSA is formally notified in DoD Directive 5105.05 and can be summarized as follows:

> 1. Analysis of the interaction of international economic and export control factors affecting U.S. national security; and the subsequent development, preparation and coordination of related DoD positions, plans, procedures and policy recommendations.
> 2. Formulates and recommends to the Under Secretary of Defense for Policy (USD (P)), DoD and U.S. Government policy positions on East-West and Free World trade and technology transfer cases reviewed by COCOM. Reviews munitions license applications for USD (P).
> 3. Responsible to assess end-use and the potential military application of transferred technology which could impact U.S. national security, and to conduct the annual assessment of technology transfer, as well as directing compliance with DoD Directive 2040.2 [25:1-2].

Defense Technology Security Administration has seven directorates (see Figure 7) which carry out the organization's mission. Directorate of Strategic Trade concerns itself totally with overall policy on dual-use technology and liaison closely with Department of Commerce.

The Munitions Directorate coordinates comments from the military departments and DoD agencies, and formulates the final DoD position on export license requests referred from OMC.

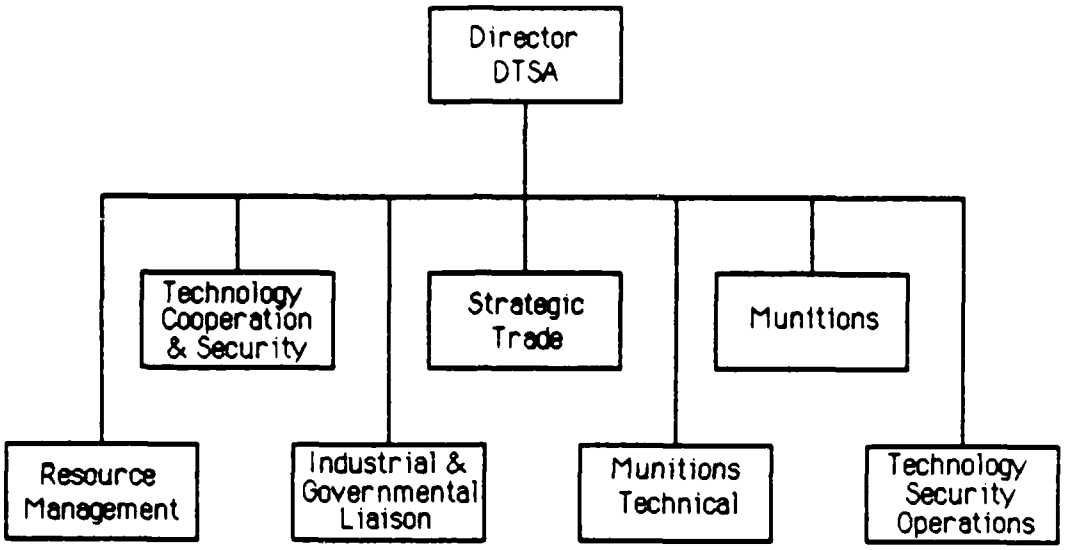


Fig. 7. Basic Organization of the Defense Technology Security Administration (32:5)

The Director of Munitions Technical produces a technical assessment of referred license cases for the Munitions Directorate after coordinating responses from the military departments; the Under Secretary for Acquisition (US/A); and the Office of the Assistant Secretary for Command, Control, Communications and Intelligence (not illustrated in Figure 5).

Technology Security Operations work in conjunction with the intelligence community in monitoring diversions, and providing assistance to enforcement agencies to halt illegal exports.

The Technical Cooperation and Security Directorate concerns itself with technology cooperation and technology

security matters to include negotiations with allies and neutral nations.

The staff in the Industrial and Governmental Liaison Directorate principally perform an education role, by keeping the public, other agencies, Congress, industry, and foreign governments current on the Technology Security Program. Resource Management provides administrative support to DTSA (32:4-6).

The Military Departments are in a unique position. Their advice and comments on technology transfer issues may be sought from any of three sources--OMC, DTSA, and foreign governments. Office of Munitions Control may direct case action to the respective military department and DTSA concurrently. This method is adopted to reduce the time involved in particular case reviews. Comments are output to DTSA for development of the DoD position. The inbound access to the military departments from DTSA and foreign missions have already received attention in the preceding paragraphs. Internal to DoD the military departments maintain extensive informal liaison across the formal lines of communication depicted in Figure 5.

Within the Department of Navy, the Chief of Naval Research provides technology assessments on a system basis, while the Chief of Naval Operations Technology Transfer Policy and Control Division (Code OP-62) has responsibility for technology transfer policy matters and the accompanying

security considerations in accordance with the NDP (32: 80-81). Consideration of the policy aspects in conjunction with security assistance program is coordinated with the Security Assistance Division (Code OP-63) (18:5-20). In mid-1987 the OP-62 and OP-63 divisions were amalgamated into the Navy Office of Technology Transfer and Security Assistance.

Army Material Command assists DTSA in assessing the impact of sharing critical military technology (on a system basis) with allies (32:80). In addition, the Deputy Chief of Staff for Logistics (Security Assistance) provides input to the process on matters concerning security assistance (52:200). Aspects of technology transfer which impinge on NDP policy are reviewed by the Director of Counterintelligence (18:7-23).

Coordination with the Department of the Air Force rests with two areas; first, the Directorate of International Programs (HQ USAF/PRI) deals primarily with the management and guidance of security assistance programs (18:5-22); and second, the Foreign Disclosure Policy Group (HQ USAF/CVAIP) is concerned with the impact of technology transfer in terms of the NDP (18:7-23).

Advice emanating from the military departments on technology transfer matters, whether FMS case or policy related, are circulated to the Office of the Joint Chiefs of Staff (OJCS). The Security Assistance Plans Division,

and the Security Assistance and Arms Transfer Division provide the Secretary of Defence with reports concerning security assistance and arms transfer programs, in particular, aspects relating to the NDP (18:5-13, 7-23).

Department of Defense agencies which provide peripheral support to the Technology Security Program include the Defense Communication Agency, the Defense Nuclear Agency, and the National Security Agency (29:34, 38-39). Defense Security Assistance Agency and the Strategic Defense Initiative Organization (SDIO) occupy a more prominent position in the system than the other three agencies mentioned above. This is by virtue that the programs and policies under their control receive greater political attention, and have higher monetary values than those programs usually controlled by the above three DoD agencies.

The Defense Security Assistance Agency has prime DoD responsibility for the Security Assistance Program including FMS. Interest in technology transfer cases is inherent in all FMS cases, particularly those involving significant military equipment. The Director of DSAA also serves as the Deputy Assistant Secretary of Defense for Security Assistance to the Assistant Secretaries of both International Security Affairs (ISA) and International Security Policy (ISP) who are also part of the technology transfer system (52:238; 29:38).

Intelligence community participation is critical to the program not from a policy perspective, but from the position of licensing, enforcement, and in the information-gathering role. The principal functionary is the Defense Intelligence Agency whose prime responsibility is assessing the number and type of illegal transfers and conducting end-user checks on intermediaries and ultimate consignees (32:24).

Assistant Secretary International Security Policy, Europe and NATO Policy (ISP/EUR) direct their attentions to formulating economic policy to include trade and military related technology transfer issues for both East and West European nations (52:170). For other nations, policy guidance is provided on political-military activities (including technology transfer and security assistance) by the ISA. In issues involving Australia, the East Asian and Pacific Affairs Directorate and the Policy Analysis Directorate will actively participate in case and policy formulation. Where action concerns offset arrangements, the International Economic and Energy Affairs Section of Policy Analysis provide input to the assessment.

Recently the Under Secretary for Acquisition assumed the responsibilities for technology transfer issues that previously belonged to the Under Secretary for Research and Engineering (R&E) which were defined in DoD Directive 2040.2. Under Secretary for Acquisition accepts

responsibility for development of the MCTL; oversight implementation of DoD technology transfer policy for all research, development and acquisition issues; and coordinate and provide technical personnel in support of the program (27:2; 32:3).

As part of the Acquisition organization, the office of the Deputy Under Secretary of Defense for International Programs and Technology (IP&T) was reorganized from the Under Secretary of Research and Engineering to the Under Secretary for Acquisitions. International Programs and Technology develop and implement international cooperative programs which involve technology transfer, in accordance with the previously stated arms transfer policy (see page 28). The IP&T also serves as the vice-chairperson on the DoD International Technology Transfer Subpanel A.

System Summary. In instances where the system would be considering policy and procedural issues directly related to Australia, some organizations may not be part of the system. Official Australian Government policy of noninvolvement in the "Star Wars Program" would indicate that the SDIO is not likely to be party to technology transfer issues affecting Australia. The geographic orientation of some functional areas, for example ISP/UER,

would automatically exclude those organizational components from being consulted on Australian issues.

The scope and the critical nature of international technology transfer issues dictate that such a broad system operate to control technology transfer policy and procedures. This system possesses the environmental dimensions of uncertainty, change, and complexity (69). International technology transfer exists in a dynamic environment, which creates uncertainty for decision makers often generating reactive rather than proactive management. Uncertainty is fueled by changes which occur constantly with technology innovation, and the vast number of transfer mechanisms; and compounded by the complexities of international politics, and trade and commerce.

Since 1981, however, the U.S. has taken steps to reduce reactive management of the technology transfer issues. This has been highlighted by the strengthening of legislation covering technology transfer, the formation of DTSA, and reorganization in Department of Commerce and Department State. All these measures are to cope with the increasing work load associated with achieving national security objectives, while at the same time not impeding U.S. industry's international competitiveness. Thus, the sheer work load, dynamism of the issues and division of responsibilities means complexity pervades the system.

Complexity of United States Technology Transfer Policy

The arguments and facts so far presented direct attention immediately to the complexity of technology transfer from a system perspective. The policy is unavoidably complicated, having to address the multitude of technologies, and all the conceivable illegal outlets of significant technology. Six factors have been gleaned from the material reviewed which contribute to the maze of policies and procedures.

First, the policy is designed to cover technology of both military and commercial origins which are combined in a military application. Administration of controls over dual-use technology are more demanding and require the constant attention of not only the U.S. Government agencies but also the COCOM. Several noted cases of dual-use diversions emphasize this point (30:9-10; 14:40; 58:160). A more complete discussion of the role of COCOM is outside the scope of this report, but suffice to say, that this additional burden complicates the administrative passage of a request for the transfer of military technology and the interpretation of the policy.

Second, the policy demands that a large number of departments and agencies be involved in the technology transfer system, thus making the policy and its implementation cumbersome. Continuing conflict has existed between

Department of Commerce and Defense over the exact scope and responsibility of DoD in export license cases (63:8), and conflicting policy and technical judgments on technology transfer issues (61:204).

Third, the very sophisticated nature of advanced military technology and the vast array of applications of dual-use technology to military programs also cloud the issue. The 1985 amendment to the EAA highlights the important role of the MCTL in assessing technology destined for export. Updating of the MCTL is underway to recognize the evolution of new technologies and those which are or may be utilized in military hardware. Furthermore, action to integrate the MCTL with the CCL and the Munitions List is continuing (32:75).

Fourth, the overriding regulations and Acts which are part of the policy, add to the problem of interpretation of each of the documents individually, and jointly, in relation to the technology transfer policy.

Fifth, the purported lack of governmental direction with respect to export controls places American industry in a precarious position with respect to foreign competition. U.S. industry sight the lack of initiatives in the renewal of the EAA as a prime example of poor direction. Industry claims it has a civic responsibility to advance foreign trade but insists their hands are tied

by overstringent regulations to protect critical technologies (58:164).

Finally, the transfer mechanisms which are available for the transfer of technology, goods, services and munitions are endless. They range through a spectrum, from government and commercial sales, international symposia on advanced technology, to smuggling and clandestine acquisition of military or dual-use technology (17: 7-23). Preventing the release to an adversary who has so many avenues of access, necessitates complex regulations which subsequently interfere with the expected smooth passage of requests for the transfer of technology by allied nations.

Australia's Defence Equipment Procurement Policy

Much of the Australian defense policy, and Australia's relationship with the U.S. has been discussed in the Background chapter of this paper. The fundamental aim of the defense policy is to continue to strengthen the commonalty of strategic interests between Australia and the countries of Southeast Asia and the South Pacific (5:19). The direction of this policy is consistent with the intentions of the ANZUS Treaty. As the Dibb Report states:

> ANZUS is an expression of our membership of the Western strategic community, and it supports our regional security role. This role is generally welcomed by neighbors and regional states . . . the ANZUS relationship ensures the security and stability of the southern flank of the countries of the Association of South East Asian Nations (ASEAN). An Australian withdrawal from ANZUS would be seen by the region as destabilizing [37:46].

Although Australia is closely aligned with the U.S., national pride, determination, and economic benefit drive Australia to pursue the goal of self-reliance. In Australia's current and future strategic circumstances the term "self-reliance" refers to the need for independent combat force capability, and the support of that capability in Australia's area of immediate strategic interest (37:107).

"Self-reliance" is not a prescription for Australia to have a full range of defense industry capabilities. However, it is necessary for Australia to have a wide range of indigenous industry capability to support the military. Only in cases when a unique defense requirement, critical strategic factors, or where local industry participation contributes to an important overhaul and refurbishment capacity will the Australian Government justify paying a substantial premium for indigenous production capabilities (37:110). Inevitably, overseas sources of supply for weapons platforms and major components are a critical requirement for the ADF.

The Australian DoD consciously diversifies its international sources of supply for competitive reasons. Despite this effort to diversify supply, Australia remains largely dependent on the U.S. for the provision of logistic support and acquisition of military hardware. It is difficult to conceive of circumstances in which the U.S. would be unwilling or unable to supply materiel in the quantities and timeframe Australia required. Nevertheless, as a measure of insurance, Australia desires to maintain a capability to maintain, repair, modify, adapt and produce defense equipment in any contingency. This is an important factor in Australia maintaining combat effectiveness (37:109). Such policies require the transfer of relevant defence-related technology principally from the U.S. which is the central theme of this thesis.

IV. Methodology

Chapter Overview

This chapter describes the methodology used to answer the research questions and test the research hypotheses stated earlier (see page 3). There is no comparative numerical data presently available on the attitudes of both U.S. and Australian officials on the U.S. technology transfer policy. To undertake the analysis, primary data was collected by way of a survey questionnaire. The initial section deals with the data collection plan that outlines the general approach adopted in gathering the data for the research. The following sections discuss the development of the survey instrument; the quasi-constructs to be measured; the type of data that was collected; the research validity and questionnaire reliability; the population and the sampling technique; the data analysis techniques; the problems with the methodology; and the method used to administer the surveys.

Data Collection Plan

Data collection consisted of two parts; first, the exploratory study which was based upon personal interviews (outlined in the section on Developing the Survey Instrument); and secondly, administering the survey that was the

focus of the data collection process. Time constraints dictated that only a cross-sectional survey be conducted which represented a snapshot in time of the technology transfer process as it applies to this thesis. Most empirical research which requires a survey, adopts the cross-sectional technique because longitudinal research is too time consuming and costly (3:94-97).

Developing the Survey Instrument

The complexity of the technology transfer issues and the lack of data specific to Australia justified some preliminary investigation to assist in developing the questionnaire from which the primary data was drawn. These interviews provided valuable information to the research.

Personal Interviews. Personal interviews presented the best method of gathering initial information. Babbit and Nystrom (4:Section III-B, pp. 1-3), and Emory (40:280) agreed that such interviews provide guidance in the formulation of the survey instrument.

A judgement sample of seven people was chosen for interviews. The size of the sample was dictated by constraints of time, cost, and the individual's availability. The sample included key personnel at about director level (colonel equivalents) of both the U.S. Government, and the Australian Government. The officers or their functional (job) position were determined from the literature review,

advice from the Australian Embassy staff, and personal knowledge of the Australian DoD. The author delivered structured interviews to four U.S. officers (two from DoD, and one each from Departments of State and Commerce), and three Australian officers (three Australian DoD personnel--two in the Australian Embassy and one officer at Defence Headquarters in Canberra). The interviews were comprised of 20 open-ended questions which were delivered to a prearranged plan, with each interviewee being asked the same questions (see Appendix D) in the same order. The responses were recorded by hand.

The sample members conformed to two broad criteria; first, they belonged to agencies that were concerned with technology transfer; and secondly, that they were involved in policy and/or individual case actions concerning west-to-west technology transfer issues, but not all of whom were specifically connected with Australian cases.

In this development stage of the questionnaire, the open-ended response format allowed for a spontaneous response from the individuals which provided useful information in formulating the questionnaire to obtain evaluative information. Furthermore, the open nature of the questions enabled discussions to flow from the structured questions into areas of related interest. The interviews not only contributed towards the development of the survey

instrument, but also towards amassing further information in six respects.

First, they provided a better understanding of the factors or criteria which make up the mental set of individuals in evaluating the technology transfer systems (4:III-B, p. 4).

Second, some idea of the range of favorable and unfavorable opinions was gained toward each factor discussed at the interviews that related to investigative questions of this thesis (4:III-B, p. 4).

Third, a tentative knowledge was gained of the individual group differential opinions toward the subject of this thesis (4:III-B, p. 4). Generally, each of those interviewed had an intimate knowledge of the technology transfer policies and process, and only on specific items were some of the respondents not able to proffer a reply.

Fourth, the interviews provided an insight into appropriate wording that was utilized in the survey instrument, and of any sensitivities respondents had towards questions covering a particular aspect of technology transfer.

Fifth, each respondent contributed valuable information concerning operational policies and procedures adopted by both governments, and general information on the transfer of technology.

Finally, those interviewed demonstrated a genuine desire to divulge what information they believed to be important to the topic, which often led to another functional position from where further information was available.

Analysis of the data from these interviews was conducted by making simple comparisons of the responses which were then utilized to formulate the questionnaire.

The Survey Instrument. A cross-sectional survey represented the primary source of data from which was collected attitudinal responses from both U.S. and Australian Government officers concerning aspects of the transfer of military technology from the U.S. to Australia. The survey took the form of a questionnaire that was delivered to a sample chosen from each of the U.S. and Australian populations.

The survey instrument (see Appendix E) contained a total of 31 questions which were divided between Part I and Part II of the questionnaire, while Part III sought comments from the respondents on issues addressed in the questionnaire. Part I included statements or questions that were directly related to the heart of technology transfer issue as it applies to this thesis. Here respondents were required to rate, on a Likert scale, their level of agreement or level of importance of the various

statements. This part of the survey was designed primarily to gather data from which to test the hypotheses, and assist in answering the investigative questions posed in Chapter I. Part II was designed to compile a minimal amount of demographic data about the respondents.

Constructs to be Measured

Eight quasi-constructs (complex concepts) were developed to capture and measure attitudes of both U.S. and Australian officers on the policy as it applies to the transfer of military technology to Australia. Borg and Gall indicate that

> . . . psychological concepts such as intelligence, and similarly concepts involving technology transfer are not directly observable, but are inferred on the basis of their observable effects on behavior [9:141].

However, this research is based on measured responses from elements of a very narrow population group, therefore lacking external validity. Rather than support a broad generalization, this study attempted to find predictors of criteria on an empirical basis to test the theory of attributable differences between U.S. and Australian respondents on specific technology transfer issues (9:142). Each quasi-construct or predictor was examined to determine if differences exist between the attitudes of the Australian and the U.S. officials about various aspects of technology transfer. The term quasi-construct was used to define the eight categories of variables based upon an a priori

expectation about the relationship between variables. Since these constructs were not statistically derived, and are not known to be independent the term "quasi"-construct was considered appropriate.

To determine the relationship between the U.S. and Australian populations, composite variables or indexes were calculated which represent a value for a particular quasi-construct. An explanation of these measurement indexes, and the origins and justifications for each of the quasi-constructs are contained in the following two subsections.

Formation of Indexes. Theoretical constructs normally have several dimensions which are necessary to measure. By combining each of the dimensions within each construct, a representative index is obtained for that construct (40:103).

Each statement or question in the survey represented a variable, which each respondent was asked to rate according to the appropriate Likert scale. Scores were formulated by summing responses for each variable within a particular quasi-construct. From these summed scores, mean values for each quasi-construct were formulated by country. These means represented the indexes upon which the hypothesis tests (H1 to H8) were conducted. Further discussion on these composite variables or indexes are contained in the Data Analysis Techniques Section on page 84.

Constructs to be Tested. The quasi-constructs stated below are believed to contribute towards understanding the technology transfer policy, and its implementation. The quasi-constructs were developed from a synthesis of facts derived from the literature review, and information gained during the preliminary personal interviews.

First, the focus of U.S. attention is on the impact that transfers of military-related technology have on U.S. national security and foreign policy. The U.S. and allied nations place great importance in strong defense ties that are reflected in legislation and policy on technology transfer, and bureaucratic rhetoric. For example, wide use is made of such phrases as "Australia receives the same status as NATO allies." Therefore, the U.S./Australian defense relationship was a poignant starting point for investigating the overall understanding of technology transfer issues between Australia and the U.S. Statements 1 through 4 of the questionnaire are the variables in this quasi-construct, and the data collected refers to hypothesis H1.

Second, knowledge of Australia's policy for acquiring U.S. defense equipment needs to be appreciated by both parties in considerations over technology transfer. What motivates Australia to procure a majority of its defense equipment from the U.S. is an important

consideration in each case for the transfer of technology, and policy issues that may surface. Statements 5 through 11 reflected a desire to gain data about this quasi-construct which addresses hypothesis H2.

Third, clearly a firm understanding of the U.S. policy on technology transfer is important for Australian officials when applying for the transfer of military technology, and for U.S. officials who either adjudicate over these requests or develop policy. Respondents were presented statements 12 through 17 to investigate this quasi-construct that addresses hypothesis H3.

Fourth, it is highly desirable that both parties understand what motivates Australia to seek the transfer of military technology. Australian defense policy clearly identifies self-reliance and high technology equipment as key factors towards maintaining a viable ADF. Australia's offsets policy is directed at acquiring the latest technology thereby assisting industry to become competitive so that it can effectively support the ADF. To complement Australian efforts towards self-reliance, U.S. policy fosters the concept of interoperability with allied nations. Statement 18 addressed hypothesis H4, and sought to collect data on Australia's need for technology transfer from the U.S.

Fifth, knowledge of the U.S. and Australian players in the technology transfer process is essential in determining appropriate points of entry for applications, and those who directly influence policy on technology transfer issues in both countries. Statements 19 to 21 sought to determine from the respondents their attitudes about the importance of agencies involved in the technology transfer process. These statements address hypothesis H5.

Sixth, without a knowledge of the intent and applicability of the policy documents governing technology transfer, the policy may not be applied appropriately with respect to technology transferred to Australia. Statements 22 to 24 and 26, which refer to hypothesis H6, sought to determine from the respondents their attitudes about the principal policy documents governing technology transfer.

Seventh, statement 25, which addresses hypothesis H7, was aimed at drawing a very simple measure of how the respondents felt about Australia's political status when requesting the transfer of military technology. This has some connection with the measures on the defense relationships in statement 1 through 4k.

Finally, statement 27, which refers to hypothesis H8, concentrated on the problems for Australia when requesting the transfer of military technology. This is an important facet of the study because technology transfer issues are going to become more critical for Australia in the

future. Respondents were asked to rate the importance of four potential problem areas with an option for them to include others which they felt were relevant.

Obtaining meaningful data from which appropriate indexes were formed depended heavily on the measurement scales. Without adequate scales, data would not be sufficiently accurate to measure attitudes between the two countries.

Type of Data to be Collected

A Likert scale was chosen to measure the responses to the statements or questions posed in the survey. The Likert procedure was adopted to give interval-type data. Reckase noted that while many authors suggest Likert scales give only ordinal data, he maintains that it is at least ordinal and that treating the data as interval-type data causes no harm to the research (54:52). Furthermore, the descriptive terms used in the two rating scales adopted in the questionnaire (see Appendix E) were derived from a wide variety of example scales in Babbit and Nystrom. These scales were developed so that they possessed the following attributes:

1. The scale values of the terms should be as far apart as possible.
2. The scale values of the terms should be as equally distant as possible.
3. The terms should have small variability.
4. The terms should have parallel wording [4: VIII-E, p. 1].

The descriptive terms used in the questionnaire were assumed to equate to a group of consecutively numbered categories (1 to 7 on the rating scales). The boundaries of these categories were equal to the psychological differences in the elements of the responses to each statement in the questionnaire (8:76; 54:4). The scales used in the questionnaire were assumed to provide interval-type data which possessed the properties of, an arbitrary origin, and constant units.

Two further assumptions were also made about the data derived from using this scale. First, although the variables had integer values, theoretically they are continuous variables (45:230). Second, by not allowing the respondents to make a choice of "don't know" to any of the statements in the questionnaire, they may have been forced to provide a response, without having sufficient knowledge in that area of interest. Therefore, it was assumed that these error terms were randomly distributed across the measurement scale.

Collection of the data using an interval scale provided two benefits; first, the data is more valuable than that collected using either nominal or ordinal data; and secondly, it allowed the use of parametric statistical techniques when analyzing the data (39:125).

Research Validity

Research tests must be valid both internally and externally. As Emory states, "internal validity of a research design is its ability to measure what it aims to measure." External validity refers to the ability to generalize the findings to the population and to wider areas of academic interest (38:120). Four types of internal validity are recognized--content, concurrent, predictive, and construct. Concurrent and predictive validity are sometimes grouped together and called criterion-related validity (9:136).

Internal Validity. Content validity was based upon the preliminary interviews, the extensive literature review, and an examination of the survey instrument by selected academic staff at the Air Force Institute of Technology (AFIT). The theme of the interviews and the literature review centered on material that d ctly addressed aspects of the transfer of technology between Australia and the U.S. which related to each quasi-construct.

Concurrent validity could not be tested because there was insufficient time to administer the same survey concurrently to two groups to determine whether similar scores were obtained within each group. An alternative is to conduct predictive validity testing by utilizing a cross-validation check of the sample data received (9:139).

Cross-validation was conducted using discriminant analysis to test that the variables classified the populations in two clear groups. The sample data were split into two randomly selected parts--the hold-out sample and the primary sample (42:335). The test was run on the primary sample to determine the significant variables. Insignificant variables were removed from the discriminant model, and the modified model was run against the hold-out sample. If the hold-out sample provided similar results to those gained using the primary sample, the variables are said to have good predictive validity. The results of this test are discussed in Chapter IV, the Findings. It is worth noting that Zeller and Carmines suggest that criterion-related validity is closely related to measures of reliability, where high reliability indicates that criterion-related validity is also high (71:33-34).

Construct validity is very difficult to attain even in the most rigorous academic work. As Green and Tull state, "frequently behavioral scientists must settle for only content validity or at best criterion validity" (42:198). In this study the author sought only to achieve content and criterion-related validity.

External Validity. The methodology and results of this study have limited external validity. Statistical inference may only be made about the populations and not

be generalized to a wider area of academic interest. This is caused by the inability of the results to be applied at another time, in a different setting or involve significantly different personalities (39:335). International technology transfer policy is dynamic in nature. Historically the policy has varied over time and it is likely to alter in the future. The policy's dynamism responds to pressures from various interest groups (for example, the defense industries, Congress, the President of the U.S., senior government officials, and allied nations, etc.), and the uncertainties of the international environment. Constantly changing personalities involved in the development of the policy and its implementation also affects the external validity of the study. More stringent analysis to determine the theoretical constructs would also improve external validity.

Survey Instrument Reliability

Ensuring that the measurements obtained from the questionnaire supplied consistent results is a function of the reliability of the measuring scale. Reliability is an estimate of the degree to which a measurement is free from random error (39:132). From a perspective of stability, time nor practicality did not permit the survey to be pre-tested by submitting it to the same respondents on more than one occasion to determine the instruments' reliability.

However, reliability was measured from the sample data to determine how well the measurement scales categorized individual responses within each quasi-construct. To measure the internal consistency (or homogeneity) of the instrument, Cronbach's Coefficient Alpha index was calculated. This index was computed for each quasi-construct using the RELIABILITY procedure in SPSSx statistical package (51:256,261).

Population and Sampling Technique

The Population Defined. For this study there were two populations. First, the U.S. population was defined as all those personnel within the U.S. Government who were directly responsible for the formulation and implementation of policy and procedures for the transfer of military technology from the U.S. Second, are those Australian Government officials who respond to U.S. technology transfer policy and procedural matters as they affect Australian acquisition of defense equipment.

The Sampling Technique. Identifying the specific elements of both populations based on the individuals involved in technology transfer issues is an insurmountable task within the time frame allowable for this thesis. First, personnel mobility is extremely high within both the Australian and U.S. Government bureaucracies, and therefore tenure by an individual of a functional (job)

position is often for only a short period of time. Second, implementing the technology transfer policy within the U.S. Government requires coordination between a host of agencies and departments. When a particular request for technology transfer is received within the U.S. Government either all or only some of these agencies and departments may be consulted on the specific cases, dependent upon the country from which the application is received, and the nature of the application. Therefore, from a practical standpoint it was more appropriate to consider the relevant functional (job) positions as the basic element of the statistical populations rather than individuals occupying those positions.

However, not every functional position (element of the population) could be identified because of the fragmented information about which particular position was relevant to this research, and the exact responsibilities of those positions. No computer data base is available within both the U.S. or the Australian Governments which would allow quick access to this type of consolidated personnel information. In addition, it is a common occurrence that established functional (job) positions frequently have outdated duty statements which do not reflect the current responsibilities of the position.

As a consequence of not being able to identify all the elements of the population, the only sampling method

available was judgement sampling. A sample of 44 functional (job) positions was chosen from within the U.S. population, and a sample of 61 functional (job) positions was selected from the Australian population (see Appendix F). The elements of the samples were identified from the literature review (mainly from U.S. DoD Directives pertaining to technology transfer); advice from the Australian Embassy in Washington DC; discussions with people knowledgeable on technology transfer matters; the Australian DoD functional directory (24), the author's personal knowledge; and from the preliminary personal interviews. It was felt that the judgement samples were sufficiently representative of the population because each of the relevant organizational elements, down to branch level, within both government bureaucracies were sampled (45:269). Additionally, the normal distribution approximates the actual observed frequency distribution of many phenomena including human characteristics such as attitudes (45:230).

Assumptions. Therefore, for this research, the following assumptions were made:

1. The normal distribution underlies the population.

2. The variables are continuous random variables.

3. The samples are independent and representative of the population.

4. The data is interval-type data.

5. The error term is randomly distributed across the measurement scale.

These assumptions permit the use of inferential statistical techniques for the analysis of the data obtained from the questionnaires.

Data Analysis Technique

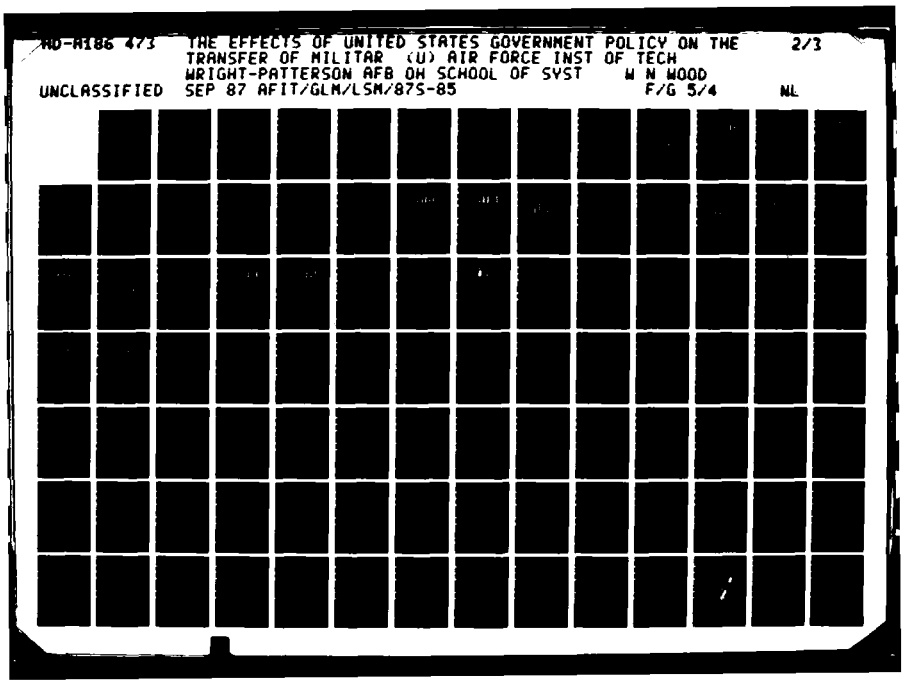
A number of statistical techniques were used to assist in analyzing the data. The hypothesis tests were conducted using t-tests and discriminant analysis while simple descriptive statistics, such as frequencies, histograms and means, were utilized where possible to assist in analyses and presenting results. The SPSSx statistical software (Release 2.1 for VAX UNIX) was used to conduct the statistical analysis. SPSSx was run on the UNIX operating system of the AFIT VAX 11/785 computer. The SPSSx command and data files are at Appendix G. Details of the appropriate techniques are discussed in the following subsections.

Recoding Data. The RECODE command was used to reverse the values received for statement 9 which was phrased in a negative sense while the remainder of the statements in that quasi-construct were couched in positive terms. This was necessary before running the reliability analysis, discriminant analysis, and the t-tests.

Reliability Analysis. The analysis was conducted using the RELIABILITY procedure to calculate Cronbach's Coefficient Alpha index for each quasi-construct. Reliability of a measure improves as the index approaches 1 from 0. Variables which had negative or extremely low corrected item-total corrections were removed to improve the reliability of the scale, and therefore not included in the t-test calculations. The corrected item-total correlation shows the contribution that that particular variable makes to the overall reliability measure within each quasi-construct (51:256). Nie and Hull note that Guttman (1945) makes the following assumptions which underlie reliability analysis:

> 1. Reliability is defined as the variation over an infinitely large number of independent repeated trials of errors of measurement.
> 2. There exists an infinite population of objects for each item being measured.
> 3. The observed values of an individual on an item are experimentally independent of the observed values of any other individual on any other item.
> 4. The observed values of an individual on an item are experimentally independent of the observed values for that individual on any other item.
> 5. The variances of the observed scores on each item and the covariances of the observed scores between items exist in the population [51:249].

Discriminant Analysis. A direct discriminant analysis was performed to identify which variables contributed to classifying or clearly discriminating the attitudes of the Australian and U.S. [illegible] standardized discriminant score [illegible]


AD-A186 473 THE EFFECTS OF UNITED STATES GOVERNMENT POLICY ON THE 2/3
TRANSFER OF MILITAR (U) AIR FORCE INST OF TECH
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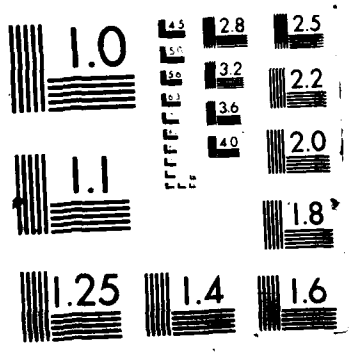
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4.0

(or questionnaire) by group (Australia or U.S.). These scores represent the number of standard deviations the individual case scores are from the mean of the discriminant function for that particular group. A single group centroid is calculated which represents the mean of the discriminant scores for that group. A comparison of the group centroids for each country indicates how far apart the groups are along the dimension (50:443). Because the discriminant scores are standardized, the important consideration when examining the group centroids is the absolute difference between each group.

For cross-validation the tolerance test identifies variables which contribute to the predictive capability of the model. Tolerance is the property of the within-groups variance not accounted for by other variables in the analysis. Those variables which fail to achieve the minimum tolerance level were removed from the analysis. Minimum tolerance of a variable "x" is the smallest tolerance any variable in the analysis would have if "x" were included. The hold-out sample was run against the model without those variables which failed the tolerance test (50:293).

Afifi notes that Fisher (1936), when developing discriminant analysis, assumed that there was no distributional assumption for the variables. However, for the

procedures developed to test the hypotheses the following assumptions are made:

1. Variables have a multivariate normal distribution.
2. The covariance matrix is the same for both populations but the mean values for variables may differ between the populations.
3. The sample is randomly selected.
4. The two populations are thought of as two sub-populations of a single population [1:257-258].

This analysis generates a Chi-square statistic which is ideal for testing the global null hypothesis (1:247-269).

Descriptive Statistics. The FREQUENCIES procedure was utilized to generate frequency tables, histograms and means and standard deviations for variables which are treated individually in the Findings chapter, and not as part of the t-test calculations (59:265).

Pearson Product-Moment Correlation Coefficient. PEARSON CORR procedure produces Pearson product-moment correlation coefficients with significance levels. These coefficients are a measure of the strength of the linear relationship between two variables (59:579; 48:418).

Composite Variables or Indexes. To obtain the composite variables described in the section on formulating indexes (page 69) the COMPUTE procedure was used. This procedure was activated immediately prior to all other

procedures except FREQUENCIES where original raw data was required.

Student's t-test. The T-TEST procedure performed the t-tests on the means of the composite variable which relate to each quasi-construct. The two-sample t-test enabled inferences to be made about the differences between the two population means. To use the t-test the following assumptions were made:

1. The observations were independent.
2. The observations were drawn from a normally distributed population.
3. These populations had equal variances.
4. The measurement scales were at least interval [39:413].

T-TEST compares sample means (in this case by groups for independent samples) by calculating Student's t statistic, and tests the significance of the difference of the means. The output table provides an F-distribution two-tailed probability which guides one's decision to use either the pooled variance estimate of the T-value or the separate variance estimate of the T-value in testing the hypothesis. If the F-distribution two-tailed probability is greater than the level of significance, the pooled variance estimate was used to test the hypothesis. When this F probability was less than the level of significance, the separate variance estimate was used to test the hypothesis (50:267-275). The general hypothesis was:

H_0: $\mu_1 - \mu_2 = D_0$: There is no difference in attitudes between the Australian and U.S. populations.

H_1: $\mu_1 - \mu_2 \neq D_0$: There is a difference in attitudes between the Australian and U.S. populations.

where D_0 = hypothesized difference between the means (this is often zero).

alpha = .05 level of significance (48:343).

Discussion of the results of the analysis using the above techniques is contained in Chapter V, the Findings.

Problems in the Methodology

Data collected from the survey theoretically may contain three sources of error (or bias). First, the sample was derived using a judgement (nonprobability) sampling technique. In nonprobability sampling, modifications to the sampling design can be introduced by questionnaire design and respondent characteristics which may affect the likelihood of any element of the population being sampled (38:216-217). This form of bias produces a systematic error rather than the error term being randomly distributed. Despite this argument it was believed that the judgement sampling technique used was free of serious question bias (achieved through careful screening of the instrument before administration to the field), and that

the sample chosen was representative of the population (previously supported on page 78).

Second, observer bias can often skew the results of the survey instrument. In this study, particular care was taken to avoid the following sources of observer bias:

1. Leading questions in the survey instrument.

2. The recording method of responses did not permit undue emphasis upon behavior that is in accordance with observers' biases or expectations.

3. The recording method did not permit the author to draw inferences about the meaning of the responses being observed.

4. The questions asked were not embarrassing or annoying to the respondents (9:105).

Given the survey instrument was reviewed by a panel of experts before its administration, the likelihood of such bias being a significant factor was dramatically reduced.

Third, data collection by survey questionnaire has a disadvantage because nonresponses to the survey may cause bias. When only a minority of the selected sample is returned, the results seldom look similar to the population as a whole, although this may not necessarily be the case (38:276-277). However, as Borg and Gall state "unless samples are extremely biased, the results often have important implications for the large population" (9:99).

Administering the Survey

The questionnaire was administered to a sample of 105 functional (job) positions in Australia and the U.S. Given the topic transgresses international boundaries and primarily involved the respective defense central establishments rather than any one of the specific armed services, the covering letter accompanying the questionnaire was co-signed by the Dean of the School of Systems and Logistics, and the Counselor Supply of the Australian Embassy. This action was deemed as necessary to elicit more positive responses to the survey. Questionnaires to the U.S. recipients were distributed from AFIT, while the surveys for the Australian officers were dispatched to the Director, International Logistic Policy within the Defence Logistic Organization at Defence Headquarters in Canberra. He assumed responsibility for the distribution and collection of the questionnaires, before returning them to AFIT.

V. Findings

Chapter Overview

The findings of the statistical analysis are presented in this chapter with a discussion of the results. Analysis of the literature was synthesized with the statistical conclusions where appropriate. The early portion of the chapter summarizes details concerning the response to the survey, and the demographic data collected from the questionnaire. However, the chapter focuses primarily on the results and discussions of the reliability analysis, and the outcomes associated with the hypothesis tests conducted using discriminant analysis and the t-tests. A summary of the reliability analysis precedes the results section which presents the major findings from each hypothesis test. Discussion of the hypothesis tests contains details on the data, expectations of the analysis, and an explanation of the results, and follows the results section. Explanation of the results incorporates analysis from the literature where appropriate. The variables that were excluded from the t-tests are individually treated in the discussion section under the particular quasi-construct with which it is related.

Survey Response Summary

The response to the 105 questionnaires dispatched were 41 (67 percent) from the Australian sample and 27 (61 percent) from the U.S. sample. These response rates are considered to be well above average given the normal response rate for a mailed survey without follow-up is 30 percent (39:308). However, some follow-up telephone reminders were necessary to increase the level of response from the U.S. sample.

Where a respondent did not answer a question either a "9" or "99" was inserted into the SPSSx data file. The "9" was inserted for missing values for all questions apart from number 29 where "99" was to be inserted. The SPSSx program automatically adjusted calculation of statistics by only using the valid responses to each question.

Some participants advised that their choice of "undecided" to certain questions indicated a "Don't know" response. These comments were confined to U.S. responses to question 20, and Australian responses to questions 19 to 22. Interpretation of these responses are treated in the appropriate results section of this chapter.

Demographic Profile

Demographic data was collected to highlight significant characteristics of both populations, similarities or unexpected different traits in the populations, and

whether DoD as opposed to non-DoD elements of the populations displayed varying responses to some questions.

The responses were identified by age groups in question 28. Figure 8 shows that 92.7 percent of the Australian participants were between ages 36 to 50 while the U.S. respondents covered a wider age span with only 70.3 percent of U.S. respondents within that 36 to 50 year age bracket.

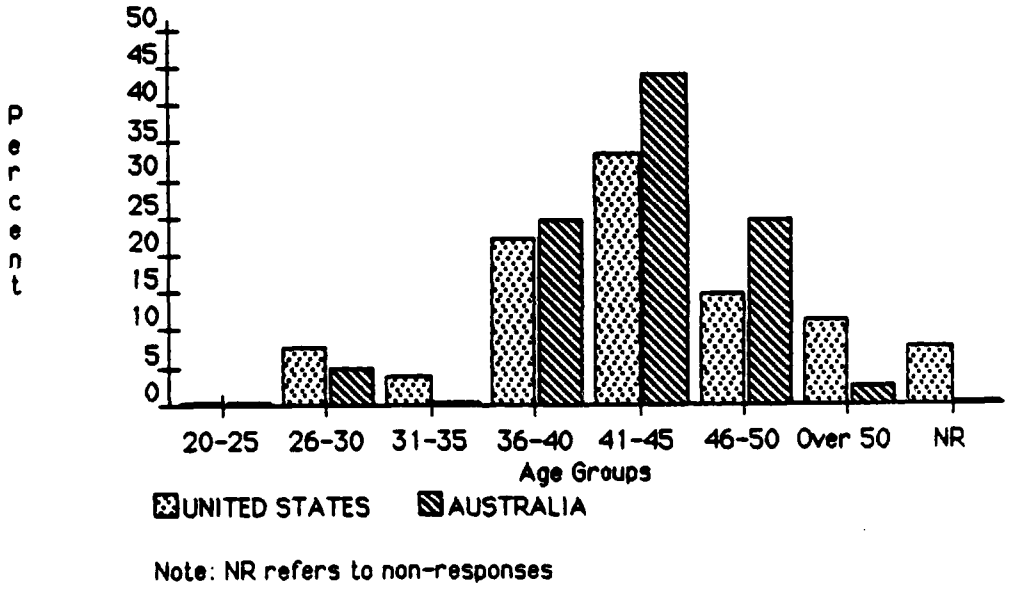


Fig. 8. Question 28: Age Group of Sample Respondents

The rank or grade profile of the respondents occupying the functional (job) positions surveyed was developed in question 29. Here a significant disparity was present in the two samples (see Figure 9). U.S. respondents ranged primarily from captain to general officer equivalent, but the Australian sample was congregated around colonel

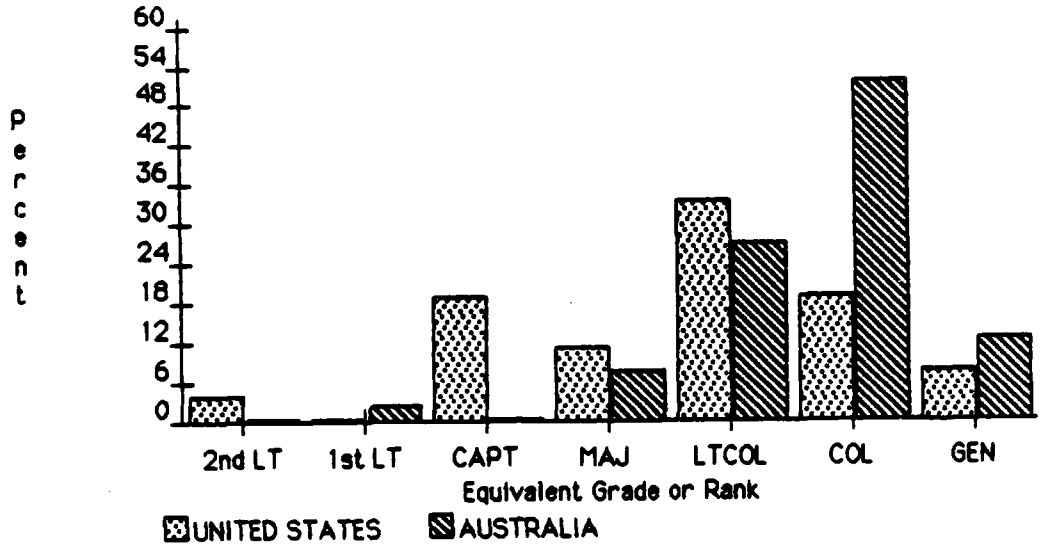


Fig. 9. Question 29: Equivalent Grade or Rank of Sample Respondents

equivalent with a much narrower spread from lieutenant colonel to general officer.

The number of years that the respondent occupied the functional position surveyed was acquired in question 30. Fifty-two percent of Australian government officials had held their positions for less than two years (see Figure 10) while the length of service of U.S. officials was more evenly spread across the spectrum. However, a majority of both samples had held their positions for less than three years which is consistent with the argument raised on page 78 that personnel within the government bureaucracy are extremely mobile.

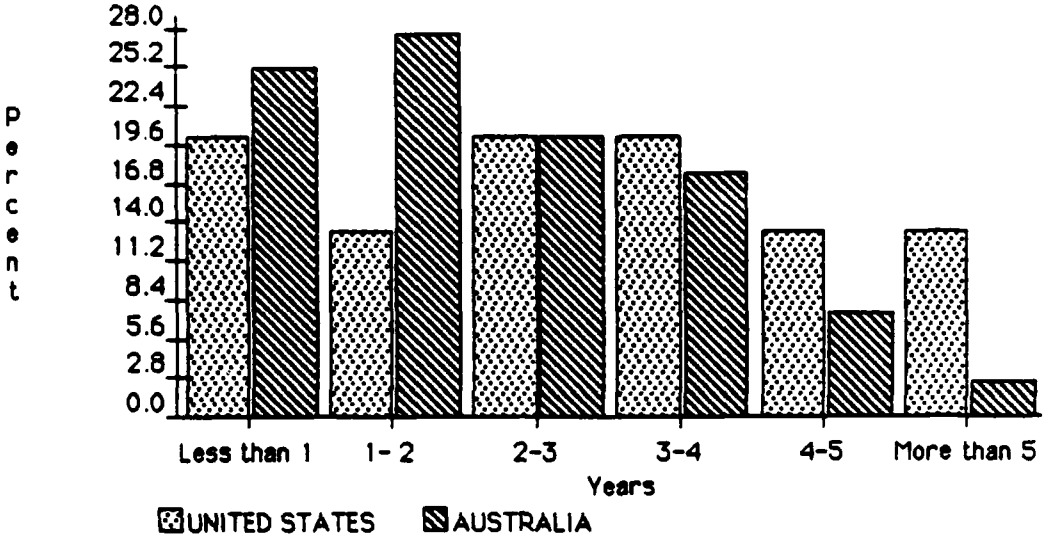


Fig. 10. Question 30: The Period Sample Respondents had Held Their Current Functional Position

Question 31 gathered general information about the agency where the respondent worked. Figure 11 shows the simple relationship within and between both samples. Readers should be aware that the proportion of responses were influenced by the sampling technique. For example, 16 percent of the Australian surveys and 32 percent of U.S. surveys were directed to non-DoD components of the respective government bureaucracies. The responses from these non-DoD elements were 10 percent for Australia, and 30 percent for the U.S. These were representative responses in relation to the proportion surveyed. This data was collected primarily to determine if there were significant variations in responses to questions according to the

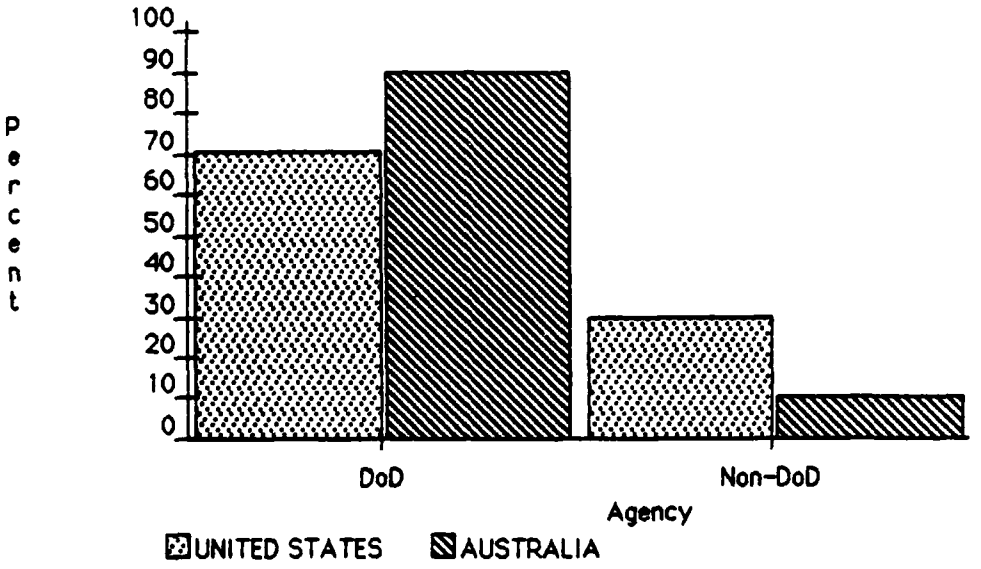


Fig. 11. Question 31: Agencies Where Respondents Worked

agency of the respondent. Apparent disparity in responses which surfaced between the DoD and non-DoD elements are covered in the relevant portion of the discussion section.

Measurement Reliability

The reliability of the measurement scale for each quasi-construct, except quasi-construct 7, was tested using the RELIABILITY command in the SPSSx program (see Table 1). Quasi-construct 7 had insufficient cases on which the program could calculate an index. As the Cronbach Alpha index approaches one the reliability of a measure improves. Questions 12, 18b, 18c, 24, 26, 27c, 27e demonstrated negative or extremely low corrected item-total correlation, indicating that those questions did not effectively

TABLE 1

QUESTIONNAIRE MEASUREMENT SCALE RELIABILITY
BY CONSTRUCT

Quasi-constructs	Alpha Coefficients Before	After
1	.84	.84
2	.70	.70
3	.71	.78
4	.59	.70
5	.79	.79
6	.59	.77
8	.44	.55

categorize individuals according to the measurement scale. Those questions were then deleted and the reliability analysis was run a second time to determine the improvement in the reliability. Table 1 shows both sets of alpha coefficients before and after the removal of the variables listed above. A significant improvement in the reliability of the measure was achieved for quasi-constructs 3, 4, 6, and 8.

Results of Discriminant Analysis

Discriminant analysis was used for three purposes; first, to determine whether the questions asked in the survey clearly classified the Australian and U.S. populations into two distinct groups; second, cross-validation

was conducted to determine whether the sample had sound criterion-related validity; and finally, the global hypothesis (H0) was tested using this procedure.

In the first instance, the discriminant scores for each case (or questionnaire) using the complete data set (total sample), demonstrated that all the variables significantly contributed to classifying the two populations. The single group centroids derived from the discriminant scores show a large absolute difference between the Australian and U.S. responses (see Table 2).

TABLE 2

DISCRIMINANT FUNCTION GROUP CENTROIDS

Sample	U.S.	Australia	Absolute Difference
Total	14.94	-9.84	24.78
Primary	-33.96	24.26	58.22
Hold-out	-21.43	11.54	32.97

Second, for the cross-validation test the primary sample included 20 U.S. and 28 Australian cases which were chosen at random from the total sample. The group centroids are displayed in Table 2. Again, the two groups are clearly classified by the variables in the sample. The analysis determined that 18 of the variables failed the tolerance test, and were therefore removed

from the model to be run against the hold-out sample data. The hold-out sample consisted of 7 U.S. cases and 13 Australian cases, and the model delivered similar results (see Table 2), although the centroid values differed to some degree. This was because the centroid values are functions of the number of cases, and the variation in the model after the tolerance test was conducted early in the analysis of the hold-out sample. Nevertheless, the model does demonstrate that the variables are good predictors and therefore indicate strong criterion-related validity.

Finally, the discriminant analysis of the total sample computed a Chi-square statistic of 170.91 upon which the global hypothesis test was conducted. The results and discussion of this test are expounded more fully in the following sections.

Results of the Hypothesis Tests

Seven of the nine hypotheses posed were rejected at alpha = .05 significance level, indicating a significant difference in attitudes between the two populations. The results are summarized in Table 3, and discussed in the following section. A feature of the results was the wide variability in the U.S. responses--a factor which might be attributed to the wide range of agencies involved in the process, and their slightly differing interpretation of the technology transfer policy.

TABLE 3

RESULTS OF THE HYPOTHESES TESTS

Hypothesis	Test Statistic Value	Degrees of Freedom	p-value	Reject H_0
H0	$\chi^2 = 170.91$	64	.000	Yes
H1	$t = 1.66$	66	.102	No
H2	$t = 4.03$	66	.000	Yes
H3	$t = -7.35$	66	.000	Yes
H4	$t = 3.14$	66	.003	Yes
H5	$t = 1.62$	66	.111	No
H6	$t = 3.18$	66	.002	Yes
H7	$t = 5.60$	66	.000	Yes
H8	$t = -5.05$	66	.000	Yes

Discussion of Statistical Analysis

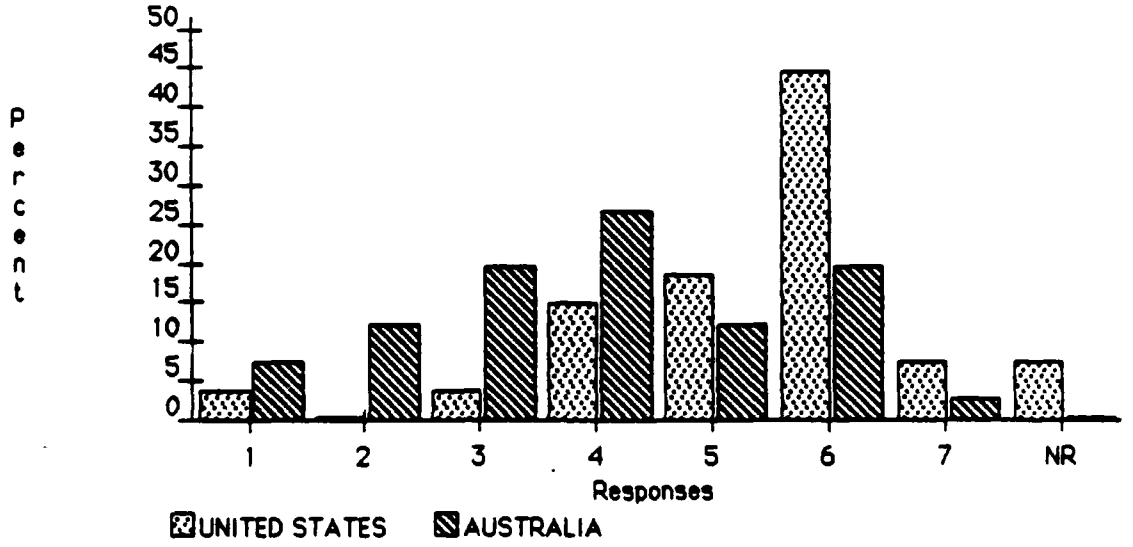
The results of the hypothesis tests have been dealt with above, but a detailed discussion on each hypothesis ensues, so that the statistical results are more meaningful. Individual discussions focus, where appropriate, on whether expectations gained from the literature review were corrobrated by the statistical analysis; any peculiarities in the data; explanations of the results; discussion of corroborating literature; supporting statistical techniques; and discussion of any individual variables that were omitted from the composite variables to measure the attitudes within each quasi-construct.

Hypothesis H0. The chi-square statistic from the discriminant analysis indicates that there was a significant statistical difference in attitudes between Australian and U.S. officials on policy matters concerning the development and implementation of the U.S. technology transfer policy. Rejection of this hypothesis was consistent with the rejection of six out of the eight hypotheses related to each quasi-construct. These quasi-constructs may be regarded as elements of the global quasi-construct represented in the hypotheses as H0. Rather than use the technique of composite variables, direct discriminant analysis was used. All variables entered for the analysis of the total sample met the minimum tolerance criteria and were

retained in the model to calculate the standardized discriminant scores, and the group centroids. As shown in Table 2, the group centroids for the total sample clearly illustrates that the variables adopted in the discriminant model differentiated the two populations.

Hypothesis H1. The defense relationship between Australia and the U.S. has been a strong alliance over the past forty years, and both parties derive advantages out of that relationship (15:18). There remains a commonalty of strategic interests which fosters its growth (5:20). The t-test did not reveal any significant statistical difference in attitudes between Australian and U.S. officials on the value of the U.S./Australian defense relationship.

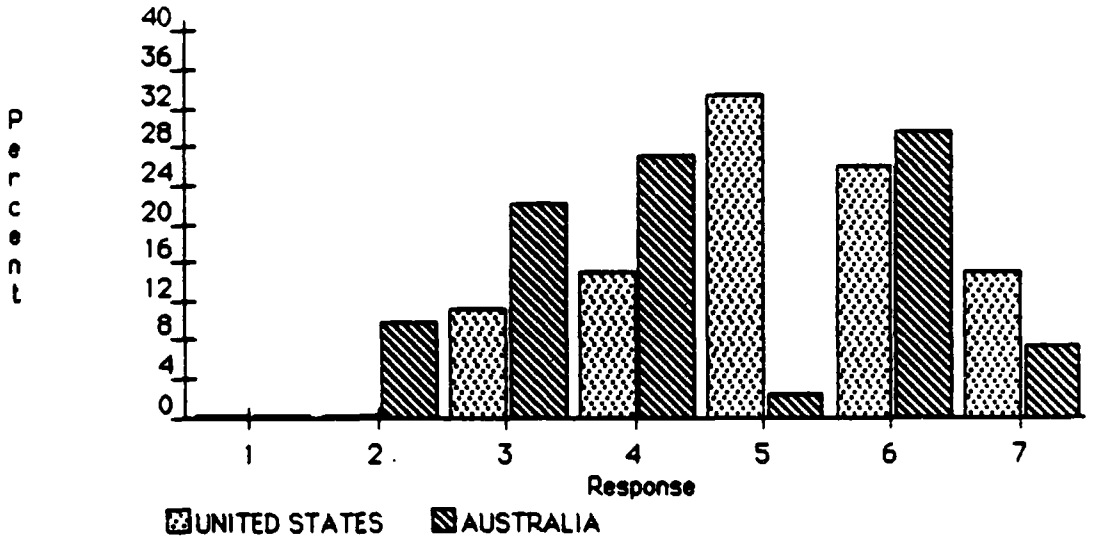
Australian and U.S. respondents displayed quite opposing attitudes to question 2 about whether the U.S. Security Assistance Program has played a key role in developing the ADF's self-reliance. The histogram at Figure 12 clearly illustrates the feelings of those surveyed. Thirty-nine percent of the Australians disagreed to some extent, 27 percent were undecided, and 34 percent agreed with the statement. However, the U.S. respondents had quite an opposite view, with 7 percent disagreeing, 15 percent undecided, while 70 percent agree with the statement.



Note: Response Scale
1 - Strongly Disagree to
7 - Strongly Agree
NR refers to non-responses

Fig. 12. Question 2: The Role of Security Assistance

Hypothesis H2. The t-test indicates Australian attitudes differed markedly to those of their U.S. counterparts regarding Australia's policy for acquiring U.S. defense equipment. The mean Australian responses for each question in this quasi-construct were consistently lower than those of the U.S. respondents, which was expected given the outcome of the hypothesis test. The most divergent mean was for question 5, where respondents were asked to rate the statement that "Australia purchased a majority of its defense equipment from the U.S. because of the strong defense relationship which exists between the both nations." Figure 13 illustrates that 74 percent of U.S. respondents



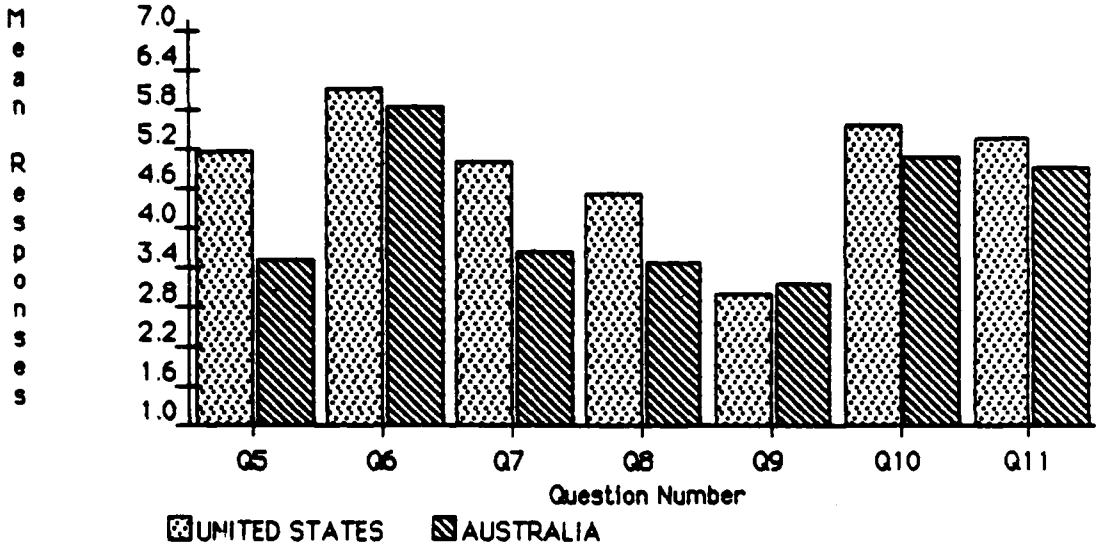
Note: Response Scale
1 - Strongly Disagree to
7 - Strongly Agree

Fig. 13. Question 5: Procurement and the Defense Relationship

agreed with the statement with only 34 percent of the Australian sharing the same opinion.

The opinions of the Australian officers on Question 5 were consistent with those expressed in Questions 7, 8, and 9. These three questions addressed whether Australia's acquisition of U.S. equipment was based upon "similar military and strategic objectives," "similar socio-economic ideals," and "interoperability" respectively. Generally the Australians slightly disagreed with these questions. The U.S. respondents had a tendency to agree with these statements apart from question 9

(see Figure 14). These opinions expressed in the U.S. and Australian responses are consistent with comments discussed by Ambassador Dalrymple.



Note: Response Scale
1 - Strongly Disagree to
7 - Strongly Agree

Fig. 14. Quasi-construct 2: Australia's Acquisition Policy

In his address to the Southern Center for International Studies he alluded to similar views held in the U.S. bureaucracy generally, when he stated that:

> There is still perhaps sometimes a tendency for people acting under the hugely demanding pressures of the global concerns that the U.S. has to handle, to speak or act as though allies were somehow members of a football or basketball team, all with numbers on

> backs, and all obliged to do the bidding of the coach or captain. As far as Australia is concerned the alliance relationship is not like that [15:16-17].

While Mr. Dalrymple's remarks extend to the broader view of the relationship, defense aspects are central to it. Questions 5, 7, 8 and 9 addressed issues directly linked with the central tenets of the U.S./Australian relationship.

Hypothesis H3. A comparison of the attitudes between the Australian and U.S. officials concerning the implementation of the policy is a central theme of the research. The t-test concluded there is a significant statistical difference in attitudes between Australian and U.S. officials on the implementation of the U.S. technology transfer policy. The different Australian perspective was expected given the tenor of the minute from the CAFTS, which was the impetus for this study. Chief of Air Force Technical Services implied Australia ought to receive similar treatment to the U.S. armed services in technology transfer matters, simply by virtue of the MOU on Logistics Support between the two countries (11:1). Such a situation is not possible given the nature and direction of the U.S. policy which was discussed in Chapter III.

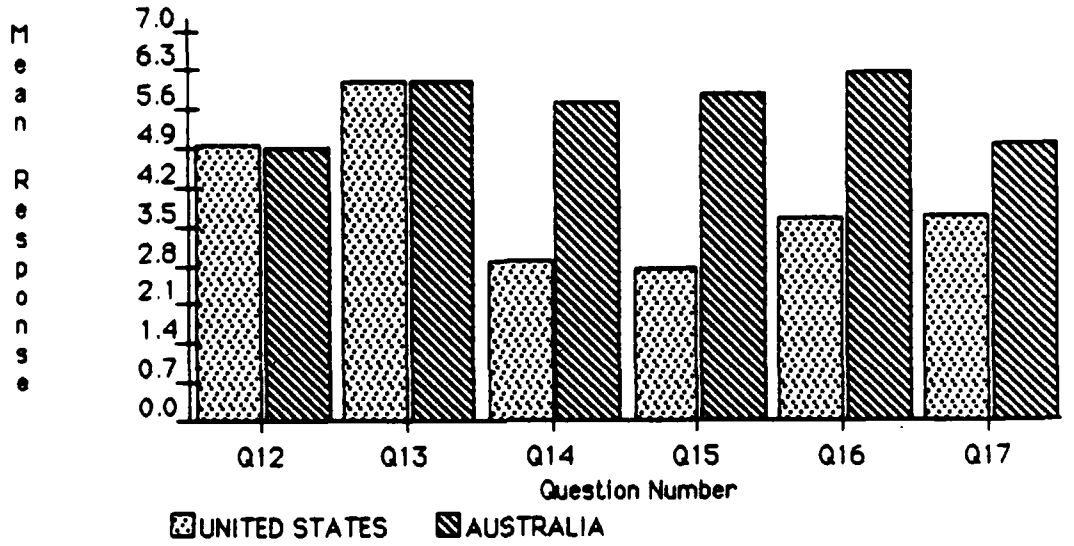
Question 12 was deleted from the t-test because of its poor performance in the reliability test. Both countries agreed that "transfer of military technology

requires complete justification on a case-by-case basis." The mean of the responses for this question were 4.93 and 4.9 for the U.S. and Australian respondents respectively.

Australia's ability to safeguard sensitive U.S. technology was the subject of question 13. Both groups agreed that Australian agencies and commercial industry were able to protect vital U.S. technology. Ninety-five percent of the Australians and 89 percent of the U.S. respondents agreed with this statement. These safeguards are achieved by maintaining acceptable levels of administrative and physical security in accordance with a general security and information type agreement ratified between the two countries. Australia notified the U.S., in March 1986, of its intention to strengthen protection of sensitive U.S. technology by implementing guidelines equivalent to full COCOM controls. These controls would be administered by a group within the Australian DoD (21:12). On 16 June 1987 the Australian Minister for Defence put in place these controls for the "export and re-export to certain countries of technology which could be used for military purposes" (7:1).

There was a striking difference in the responses, however, to questions 14 to 16. Questions 14 and 15 addressed issues about the necessity of applying for the transfer of technology in FMS, and direct commercial sales

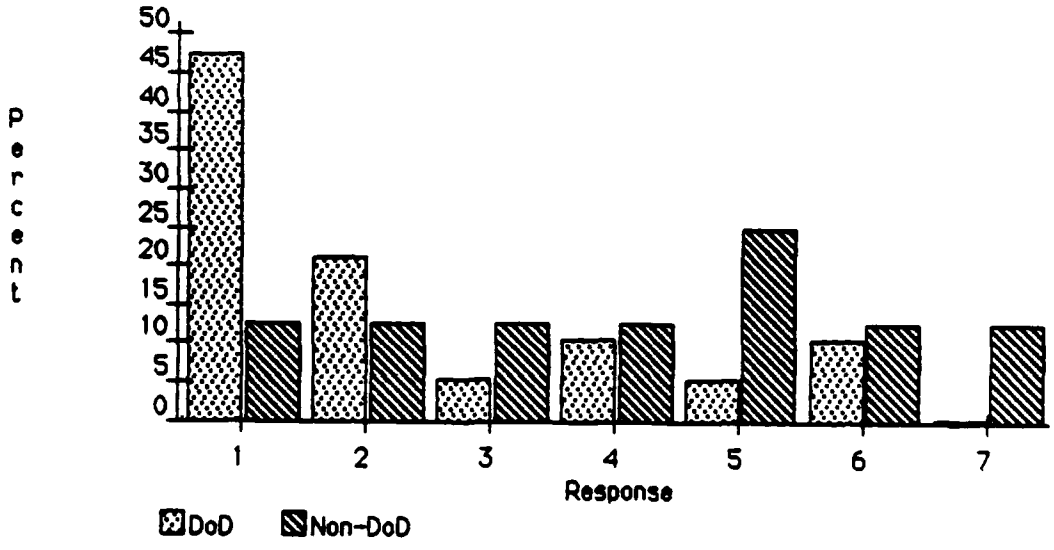
cases, respectively. Question 16 was directed at whether the ANZUS Treaty alone should facilitate the transfer of technology required by Australia. Figure 15 aptly depicts those contrasting responses where the difference in the means were very significant.



Note: Response Scale
1 - Strongly Disagree to
7 - Strongly Agree

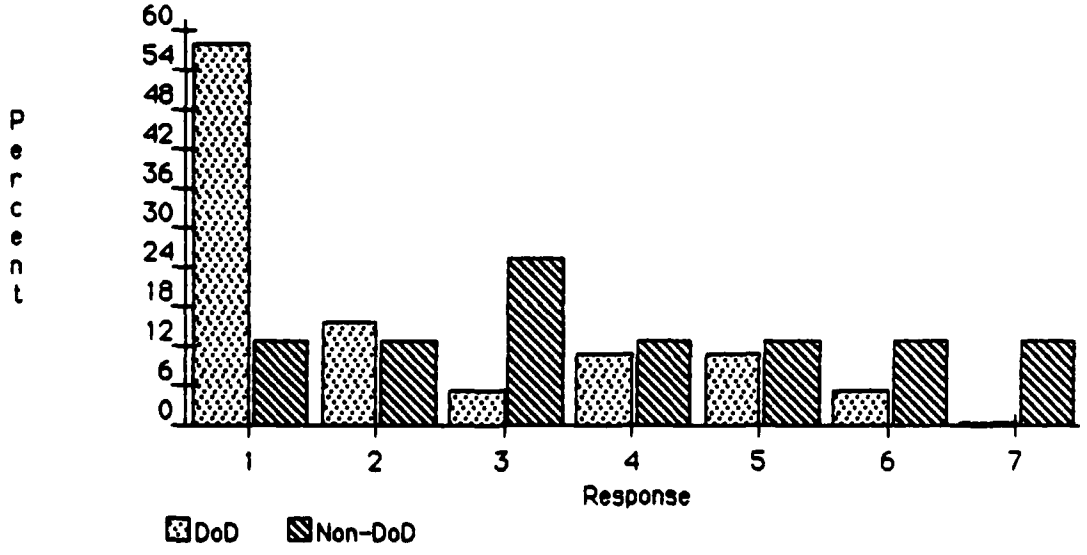
Fig. 15. Quasi-construct 3: United States Technology Transfer Policy

Besides the significance in the attitudes between the Australian and U.S. respondents, the mean U.S. score reflected wide variance in U.S. attitudes to these three questions. Individual examination of the responses (illustrated in Figures 16, 17, and 18) by the origin of U.S. responses indicate that a definitive difference existed in the DoD versus the non-DoD responses. The DoD attitude



Note: Response Scale
1 - Strongly Disagree to
7 - Strongly Agree

Fig. 16. Question 14: Technology Transfer in FMS Case



Note: Response Scale
1 - Strongly Disagree to 7 - Strongly Agree

Fig. 17. Question 15: Technology Transfer for Direct Commercial Sales

strongly disagreed with the statements whereas the non-DoD agencies were not unified in their responses nor were they strongly opposed to the statements.

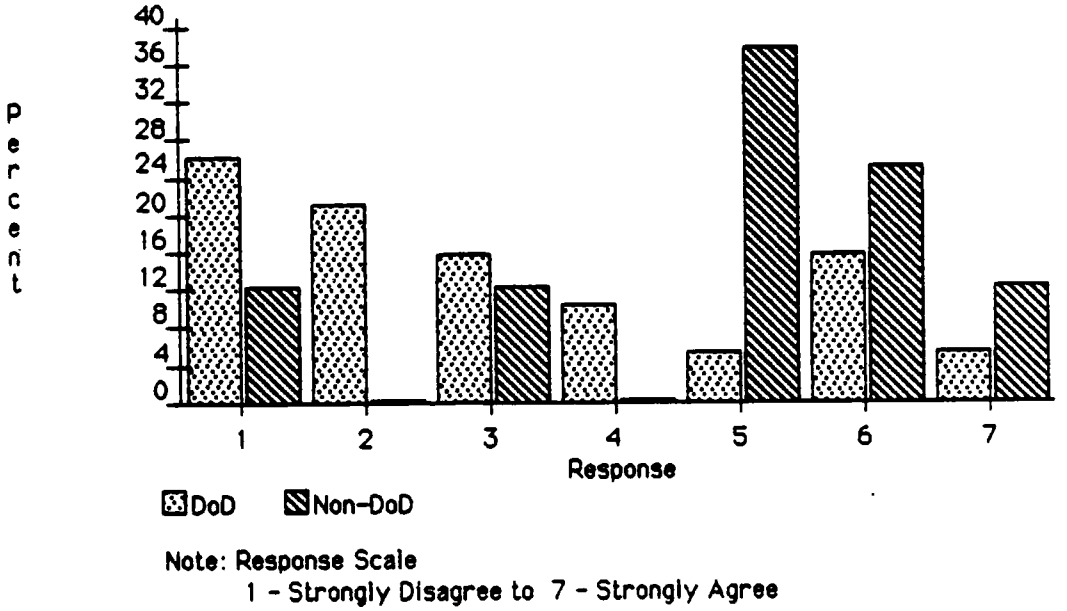


Fig. 18. Question 16: The ANZUS Treaty and Technology Transfer

Hypothesis H4. The t-test supports the alternative hypothesis that there is a significant statistical difference in attitudes between Australian and U.S. officials on Australia's requirement to transfer military-related technology from the U.S. The mean responses for the individual questions for this quasi-construct are shown in Figure 19. Questions 18b and 18c were eliminated from the t-test calculations because of their poor performance in the reliability test.

In response to question 18a, Australian officers felt it less important to acquire the latest processes

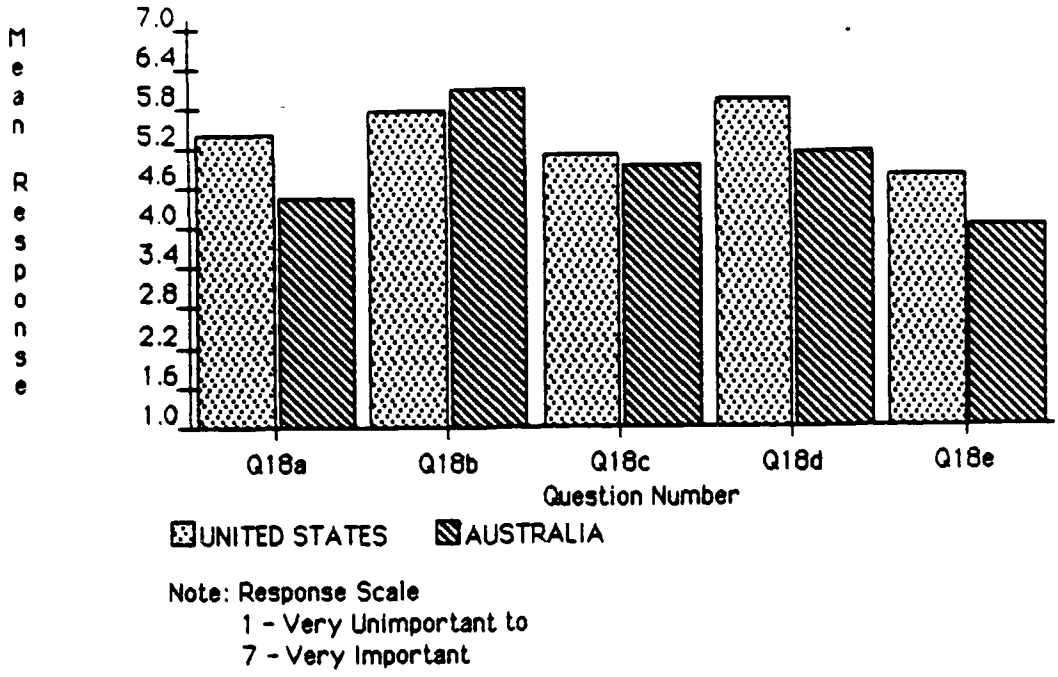


Fig. 19. Quasi-construct 4: Australian Reason for Seeking to Transfer Military Technology

and manufacturing techniques than did the U.S. officers. Similarly, in questions 18d and 18e the Australians felt it less important than U.S. officers to acquire the most advanced weapons, and develop internationally competitive industry in Australia.

In questions 18b and 18c the Australian and U.S. respondents felt it was important for Australia to seek to transfer technology to improve Australia's self-reliance, and moderately important to assist in making the ADF interoperable with U.S. forces.

Hypothesis H5. The t-test indicates that the null hypothesis could not be rejected. Therefore, it is likely

that no significant difference in attitudes exists between Australian and U.S. officials on the importance of the major organizational players in the technology transfer process. This is effectively illustrated in the histogram of the mean values for each question within that quasi-construct (see Figure 20).

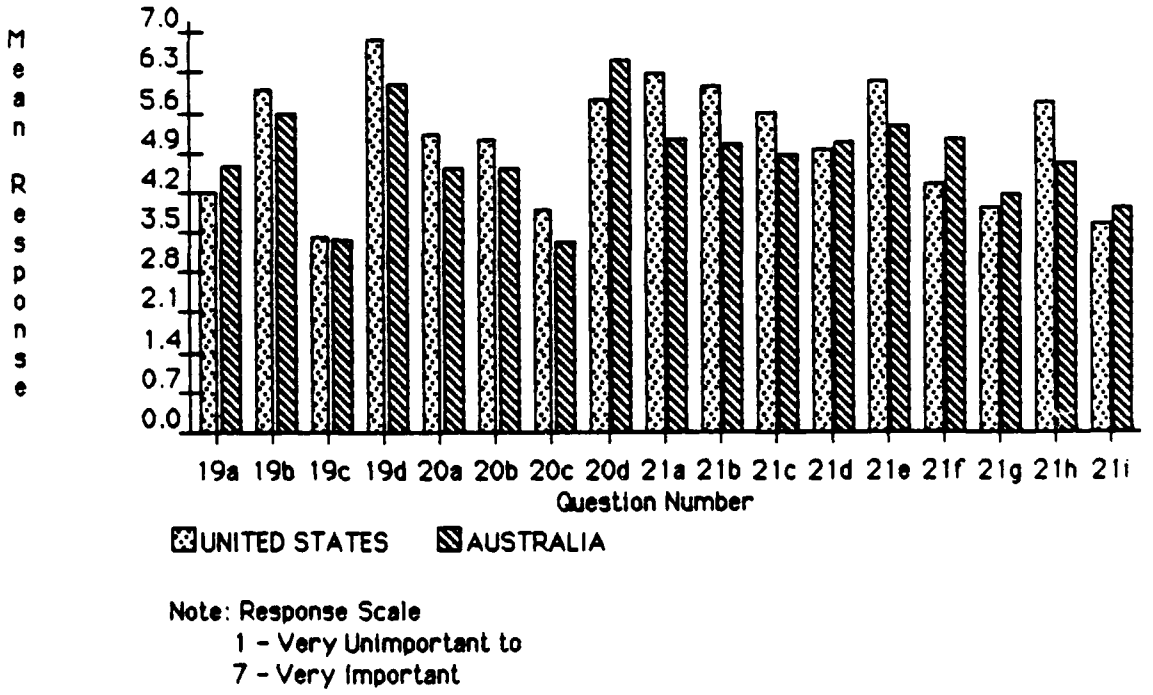
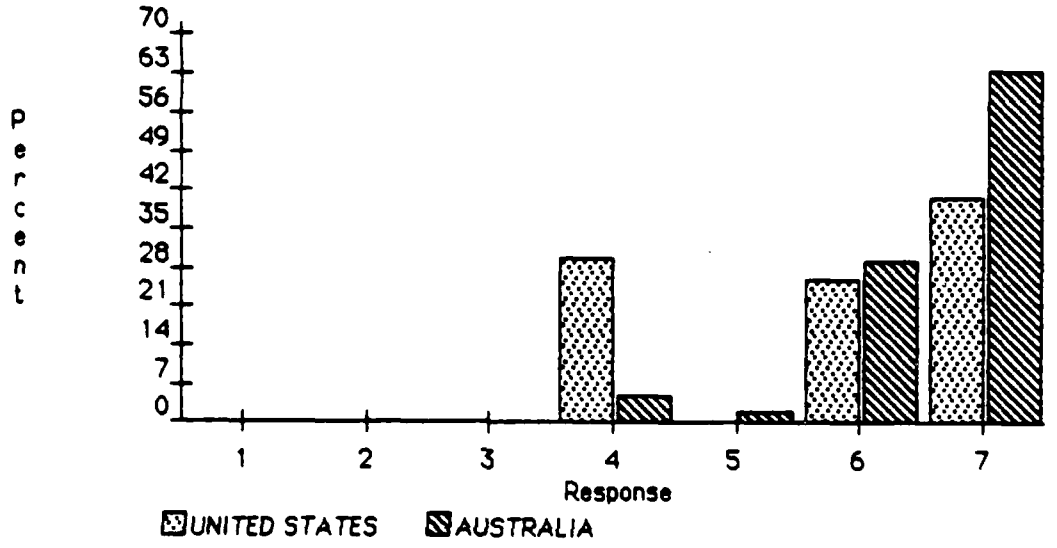


Fig. 20. Quasi-construct 5: Importance of Major Organizational Players in the Technology Transfer System

Additional interest was generated by how the respondents saw the role of the opposing government agencies. Question 20d asked recipients to rate the importance of the Australian DoD in monitoring and responding to U.S. policy matters. The Australian DoD has prime

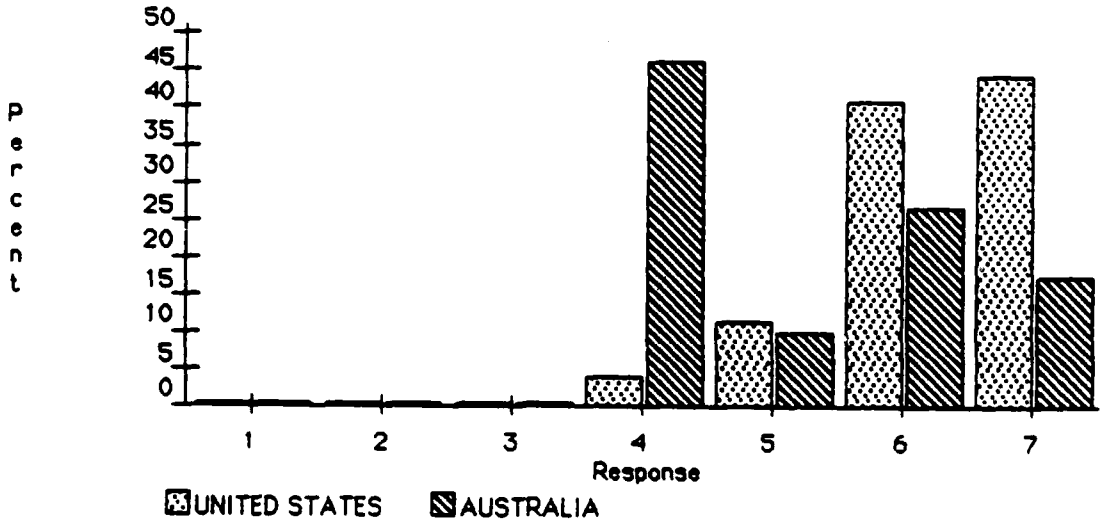
responsibility in these matters. Consequently, 95 percent of the Australian respondents believed this to be the case (see Figure 21). However, only 67 percent of U.S. respondents felt the Australian DoD had prime responsibility for this function, and 26 percent were undecided.



Note: Response Scale
1 - Very Unimportant to 7 - Very Important

Fig. 21. Question 20d: Importance of the Australian Department of Defence Role

For question 21a only 54 percent of the Australian respondents believed that DTSA played an important role in the U.S. technology transfer system, and 46 percent either did not know or were undecided about its role in the system (see Figure 22). Ninety-six percent of the U.S. respondents rated DTSA's role as important. Similar



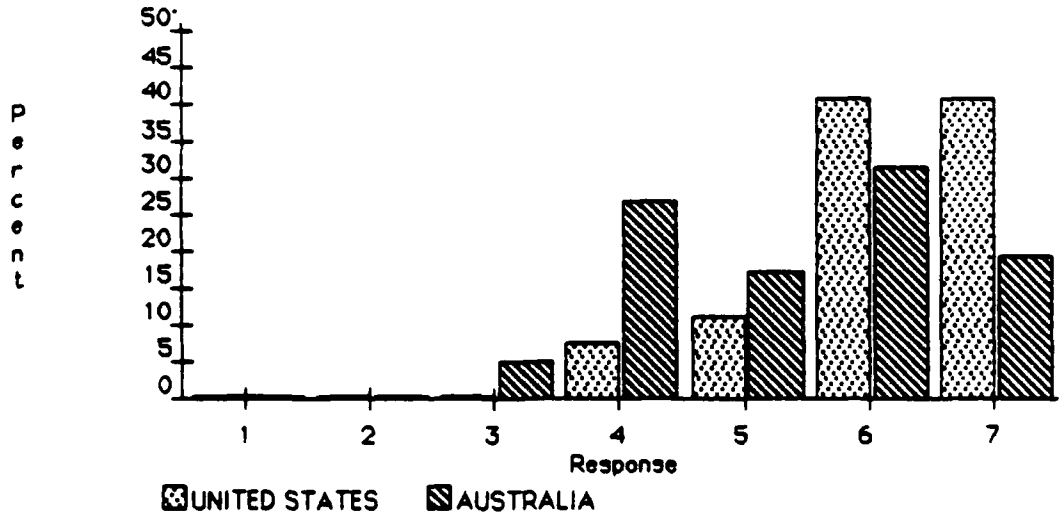
Note: Response Scale
1 - Very Unimportant to
7 - Very Important

Fig. 22: Question 21a: Importance of the Defense Technology Security Administration Role

responses were received concerning the role of the U.S. military departments which are illustrated in Figure 23.

Hypothesis H6. There was a significant statistical difference in the attitudes of the two groups concerning the importance of the principal technology transfer policy documents which included the U.S. legislative instruments and the MOU on Logistic Support. When one examines the individual results of each question within the quasi-construct there may be more important results.

Questions 22a to 22e addressed the importance of specific U.S. documents. The consolidated results are



Note: Response Scale
1 - Very Unimportant to
7 - Very Important

Fig. 23. Question 21e: Importance of the Military Department Role

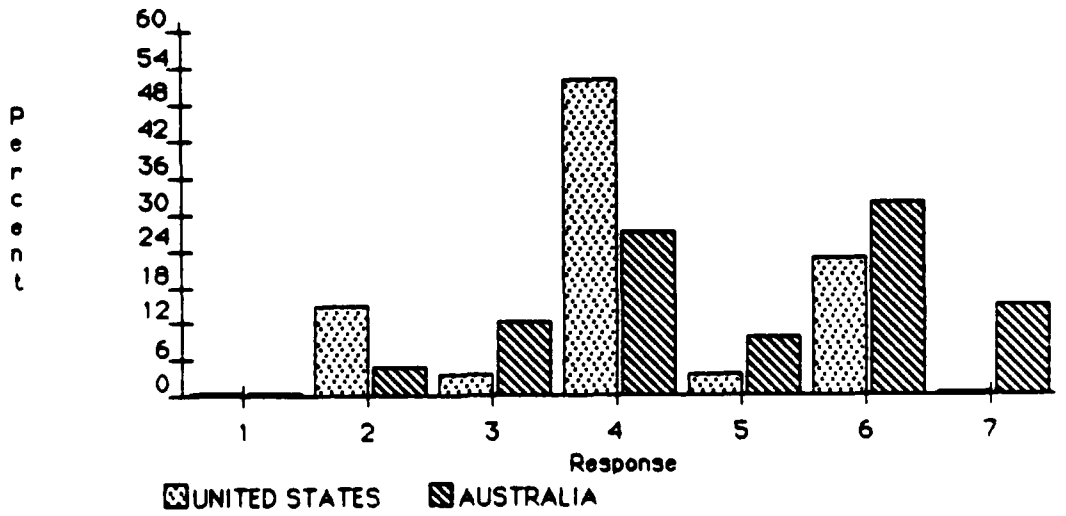
summarized in Table 4. The most critical aspect of this table is the percentage of Australians who responded "undecided." As noted previously, a number of the Australian respondents pointed out that "undecided" meant "don't know" for this group of questions.

The attitudes expressed about the adequacy of the MOU on Logistic Support (Question 23) had wide variability (see Figure 24). A large percentage of the U.S. respondents were undecided while the Australian group tended to agree that the MOU did not encapsulate the policy and procedures for the transfer of technology from the U.S. to Australia.

TABLE 4

IMPORTANCE OF UNITED STATES POLICY AND LEGISLATIVE DOCUMENTS

Documents	Australian Responses		U.S. Responses	
	Undecided	Important	Undecided	Important
NDP (Q.22a)	61%	39%	18%	78%
AEAA (Q.22b)	42%	56%	7%	89%
ITAR (Q.22c)	49%	44%	7%	89%
DoD 2040.2 (Q.22d)	46%	49%	11%	89%
EAA (Q.22e)	58%	34%	26%	63%



Note: Response Scale
1 - Very Unimportant to
7 - Very Important

Fig. 24. Question 23: Inadequacy of MOU on Logistic Support

Question 24 was to determine whether both groups felt that policy documents were less important than contractual agreements in technology transfer cases. Fifty-four percent of Australian respondents agreed that this was the case, and 7 percent were undecided. Of the U.S. respondents 37 percent agreed, and 26 percent were undecided.

Question 26 asked whether there should be a government-to-government agreement dedicated to technology transfer policies and procedures between the two countries. Respondents were simply required to answer "yes" or "no" with the opportunity to comment. Figure 25 details the results. The Australian responses to question 26 were in stark contrast to those of question 24 where 54 percent agreed that policy documents were less important than contractual agreements in technology transfer cases.

The general tenor of the U.S. comments, were that policy documents were of little value because each application was judged individually. While the Australians recognized that the transfer of military technology could only be justified on a case-by-case basis (reported from question 12), they felt that a specific government-to-government arrangement would be beneficial.

The most prominent negative responses from the U.S. group were that such a policy document:

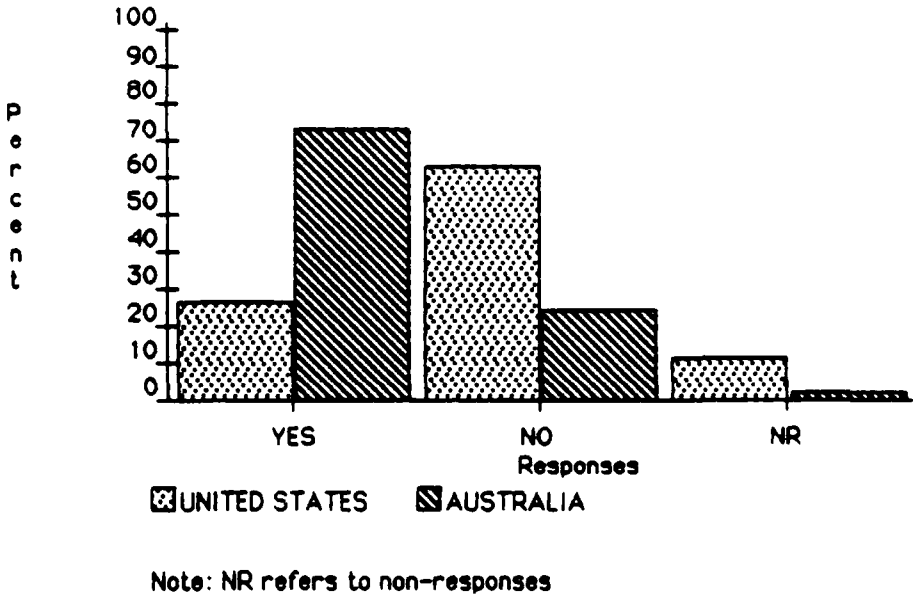


Fig. 25. Question 26: Need for a Government-to-Government Technology Transfer Agreement

1. Would be unlikely to reduce scrutiny of cases because of the U.S. legal requirements;

2. Would not improve Australia's political status in case reviews because of the already established allied ties;

3. Would become outdated because of the dynamic nature of the technology transfer system; and,

4. Would be too broad and cumbersome.

The affirmative Australian responses supported such a policy document for the following reasons:

1. Current defense equipment contracts and the MOU on Logistic Support are meaningless because they are "subject to U.S. policy." An MOU could be prepared

that is consistent with the NDP in the context of a mutual exchange of data agreement.

2. Improve Australian project acquisition management. Such a document may establish availability of certain technologies ensuring a greater probability of obtaining the desired technology before contract signature. Furthermore, it may reduce the delays and uncertainties experienced in technology transfer cases. These delays increase project costs and extend schedules to initial operational deployment of the system.

3. The development of self-reliance is fundamental to the Australian defense preparedness. A policy document of this type, at the most senior level, would indicate to U.S. officials that the objective of self-reliance should provide the basis for effective technology transfer. It should include a statement of Australia's strategic environment, and acquisition strategy.

4. The document would remove the ambiguities of the system, and dispel the perception that technology transfer decisions are motivated as much by economic considerations as by security matters.

5. A document of this nature would formally identify Australian allied status equivalent to that of NATO partners.

6. This type of agreement would clearly identify all the relevant agencies, policies, and regulatory

requirements of the technology transfer system as they apply to Australia, and establish the procedures for applying for the transfer of technology.

7. This type of document would be the ideal medium to give recognition of Australia's new export controls which apply to sensitive technologies transferred from the U.S.

From the perspective of a foreign nation, outside of the U.S. internal system, each of these affirmative Australian responses address issues which correlate with aspects concerning the complexities of the U.S. technology transfer policy discussed previously on page 58.

Hypothesis H7. The t-test supports the alternative hypothesis that there is a *significant difference* in attitudes between Australian and U.S. officials on the political status Australia receives, compared with the senior NATO partners, when applying for the transfer of military technology. Figure 26 shows that 89 percent of the U.S. respondents agreed that Australia achieved NATO status. However, only 37 percent of the Australian group agreed that this was the case, with 27 percent undecided. Despite Australia often being mentioned in the same breath as NATO in bureaucratic rhetoric, and grouped with NATO in policy and regulatory documents such as the NDP

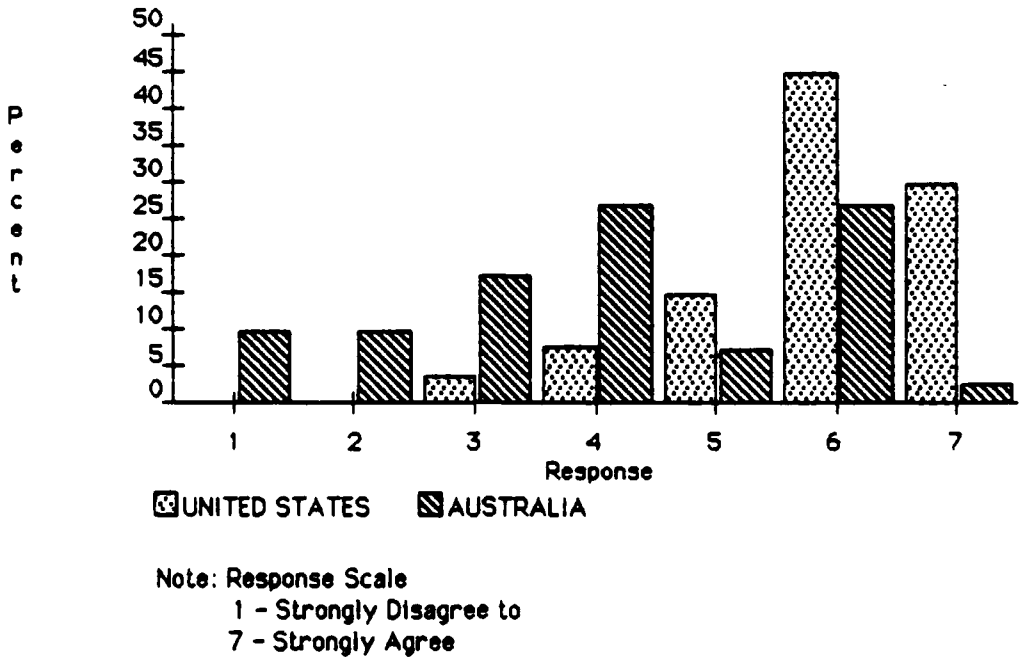


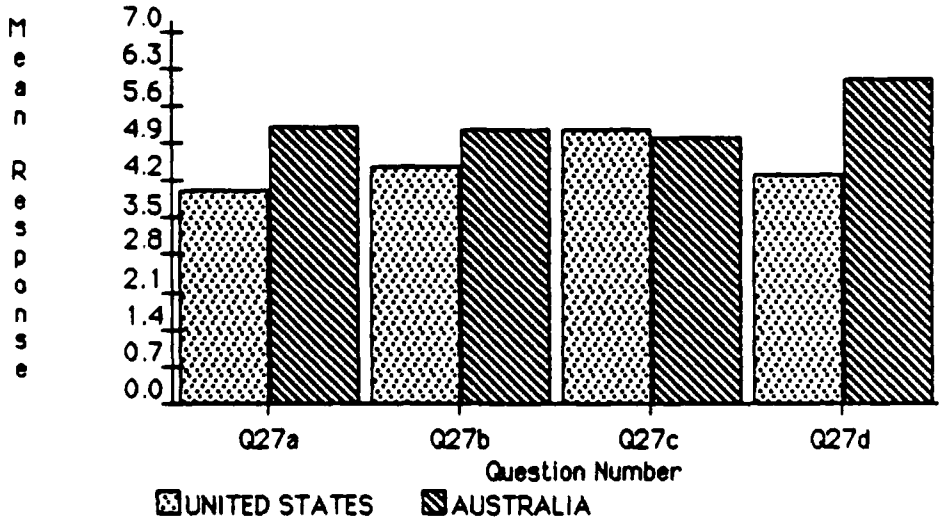
Fig. 26. Question 25: Australia's Political Status

and ITAR, the Australian respondents intimated that case outcomes have not reflected equal status with NATO.

Responses to question 25 demonstrated a significant linear relationship with questions 1, 2, 3, 4c, 4f, 5, 7, 8, 14, 15, 16, 17, 18d, 20d, 21e, 22a, and 23. Many of these variables deal with the defense treaty, the international relationship, and aspects of FMS which may explain the widespread correlation.

Hypothesis H8. The result of this hypothesis test indicates a significant statistical difference in attitudes between both groups about the importance of the potential problems posed in the questionnaire. Question

27c was not included in the t-test because it performed poorly in the reliability analysis. The differences in the mean responses to these questions are depicted in Figure 27.



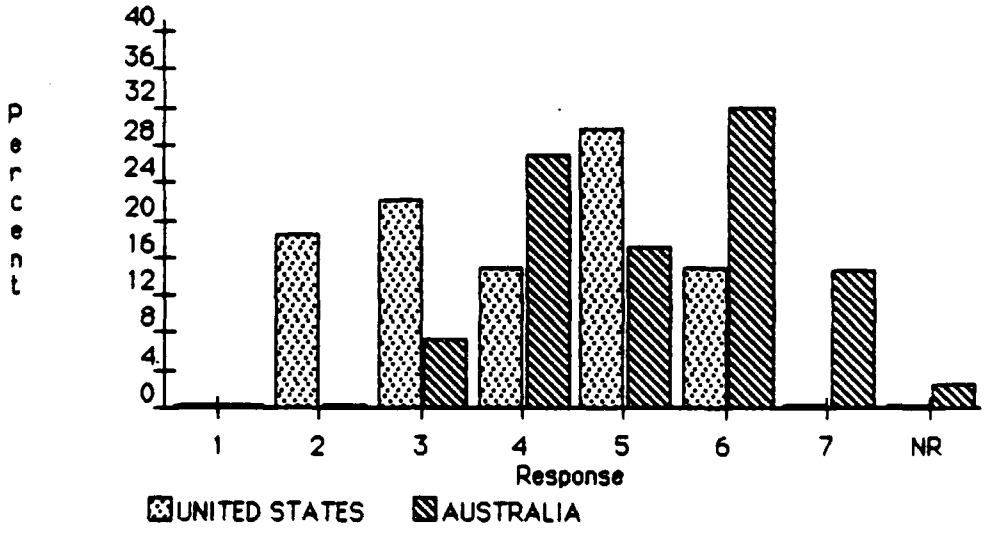
Note: Response Scale
1 - Very Unimportant to
7 - Very Important

Fig. 27. Quasi-construct 8: Potential Problems

Each problem referred to in this group of questions, apart from extraterritoriality (question 27c), was viewed differently by both groups. Additionally, the U.S. responses were examined by organizational origin (that is, either DoD or non-DoD respondents) to isolate any marked variation within the U.S. group.

The subject of question 27a was whether the large number of U.S. Policies, Directives, Regulations, and Acts lead to overly strict controls on items which are

readily available commercially or from other countries. Forty-four percent of the U.S. sample believed that the problem was important, with 15 percent undecided, while 63 percent of Australians felt the problem was an important issue, with 27 percent undecided (see Figure 28).



Note: Response Scale
1 - Very Unimportant to
7 - Very Important
NR refers to non-responses

Fig. 28. Question 27a: The Problem of the Large Number of Policies, Directives, Regulations, and Acts

Examination of the within-group U.S. responses revealed that 62 percent of non-DoD respondents believed this problem to be important, with only 37 percent from DoD expressing a similar opinion (see Figure 29).

The complexity of the U.S. bureaucracy and the impact that has on the ability of the Australian DoD to

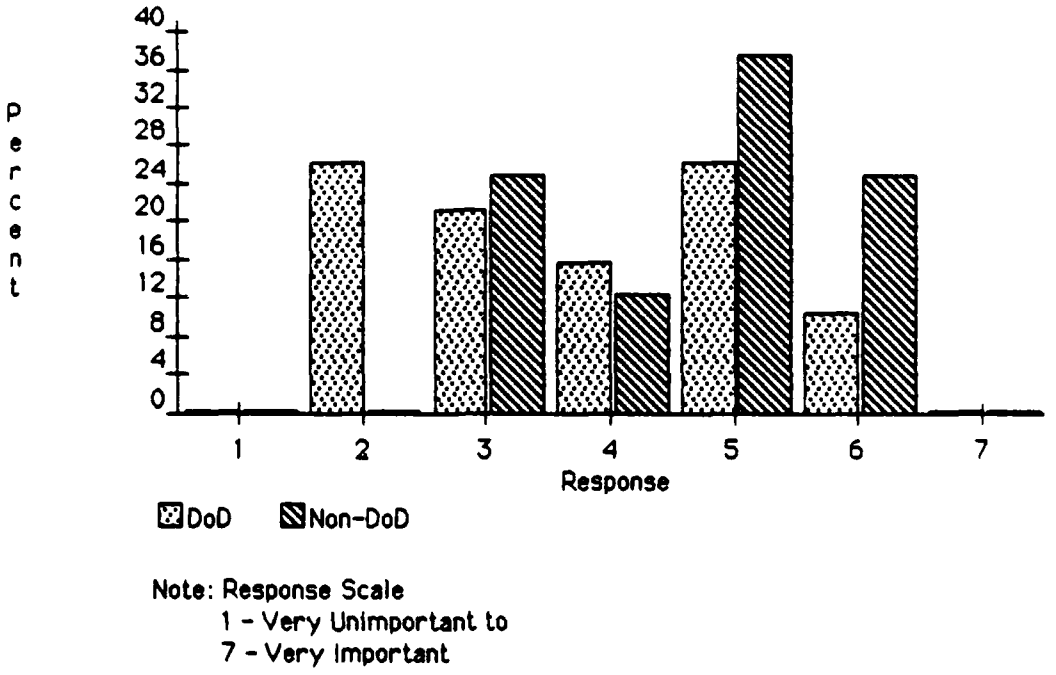


Fig. 29. United States Responses to Question 27a

identify the initial point of contact for a request for the transfer of technology, was the subject of question 27b. Here 55 percent of the U.S. officers believed it to be an important issue, while 78 percent of the Australian group felt that this was the case (see Figure 30).

The U.S. attitudes showed a within-group variance where 58 percent of DoD responses and 50 percent of non-DoD elements agreed that the issue was important.

The data for question 27c concerning the potential extraterritorial application of U.S. export laws indicated there was no difference in the attitudes between the

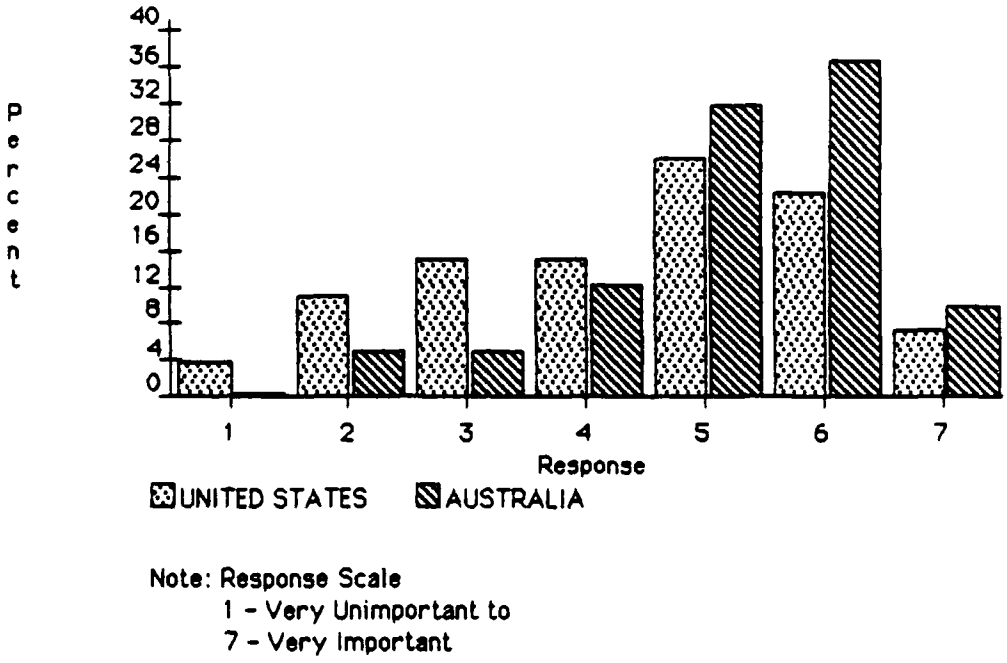
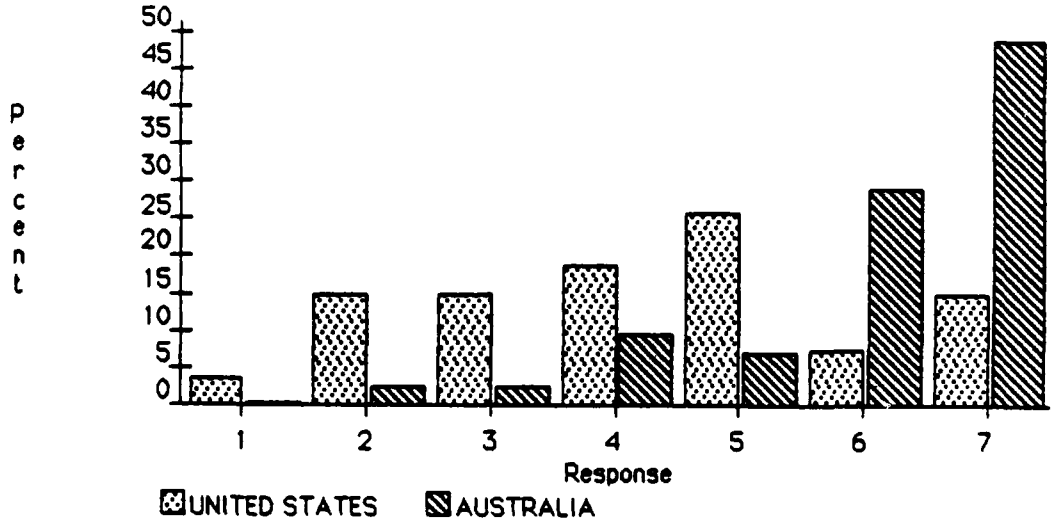


Fig. 30. Question 27b: The Problem Caused by the Complexity of United States Bureaucracy

two groups, with 63 percent of U.S. and 66 percent of Australians agreeing that this might be an important issue.

Question 27d asked respondents how important would it be to Australia's self-reliance if the U.S. were reluctant to allow the transfer of certain types of information such as source codes. Of the U.S. respondents 48 percent believed this to be important, with 18 percent undecided. However, 85 percent of the Australian group overwhelmingly believed this to be an important problem, with 10 percent undecided (see Figure 31). The within-group U.S. responses revealed that 62 percent of non-DoD respondents felt that



Note: Response Scale
1 - Very Unimportant to
7 - Very Important

Fig. 31. Question 27d: Importance of Transferring Critical Technologies

the problem was important but only 47 percent of the DoD respondents adopted the same attitude.

At the conclusion of question 27, the questionnaire gave respondents the opportunity to provide what they believed to be additional areas of potential problems for Australia. The following list summarizes those thoughts:

1. The inability of the U.S. Government to obtain sovereignty over technical data allegedly owned by private industry but yet paid for by the U.S. and Australian taxpayers.

2. Reluctance of commercial firms to release information to customers. Thus trying to retain themselves as the sole-source of supply.

3. Reluctance of commercial firms to release information to customers who may be potential competitors.

4. The U.S. technology transfer system is so designed that any one officer in the system can deny release despite higher level sanctions.

Problems Clearly Identified. The complexities of the U.S. technology transfer policy have probably developed in reaction to the uncertainties, and changes occurring in the technology transfer system. The complexities, uncertainties, and changes contribute in part to several problems isolated from the literature, that must have some impact on Australia's attempts to transfer military technology from the U.S.

First, interaction between U.S. DoD and the Department of Commerce had been the center of attention in the export licensing debate (61:212). The U.S. General Accounting Office reported in September 1986 that significant disagreements were occurring between the two organizations concerning the approval or denial of certain export licenses for strategically significant technology. Recent moves to nullify this division between the two departments included improved liaison concerning the sharing of

relevant intelligence and promptness in handling export licensing cases by electronic communications (63:2-3). Nevertheless, it is always likely that policy conflict will exist between these departments, because the Department of Commerce strives to balance international trade objectives against national security objectives while DoD is solely concerned with protecting national security.

Second, exporters often complain that DoD and Commerce interpret the regulations differently. The Office of Technology Assessment points out that their interviews confirmed a divergence of views in some key policy issues (61:212). Furthermore, at the 1985 International Arms and Technology Transfer Conference, Dr. Brenda Forman presented the following reason for the cumbersome nature of the U.S. Government policy on technology transfer.

> 1. U.S. trade policy was utterly confused. No direction, and buffeted by political winds. The problem was compounded by the U.S. Government's habit of subordinating trade and export goals to other, unrelated policy goals.
> 2. Too many policymakers regard export controls as the primary means of preserving U.S. technological leadership. This was a serious misunderstanding of the proper purpose of these controls.
> 3. The persistence of an antiquated U.S. self-image of world technological dominance across the board [41:124].

As an adjunct to this problem, many have levelled criticism at DoD for interpreting the regulations too stringently, and hence causing commercial loss to U.S. industry (61:205).

Third, within the guidelines established by the technology transfer and arms transfer policies, the technical license examiners have considerable sway over the decision to either deny or approve the export license. Thus, there is room for de facto policy making particularly with respect to case reviews of sensitive military technology (61:199).

Fourth, the issue of the solitary role that the military departments play in technology transfer cases connected with FMS cases is critical to Australia (discussed on page 44). If the review of a case is restricted to such a narrow area of responsibility, full appreciation of the facts relating to that case will not be gained. Within the military departments technical factors are paramount considerations, and not factors such as strategic implications, economic impacts, offsets arrangements, and the alliance relationship. A proper review can only be conducted if the principal elements of the system are involved, as shown in Figure 5.

To summarize, the problems cited from the literature are supported to some degree by the statistical findings. The difference of opinion between the elements of the U.S. population (DoD versus non-DoD responses) to questions 14, 15, and 16 tends to support the findings from the literature that poor interaction and divergent policy interpretation exist between the DoD and the Department

of Commerce. The sentiments of both these elements of the U.S. sample are probably further highlighted by the large within-group variance to question 27a. Here 63 percent of the non-DoD respondents believed that the large number of Policies, Directives, Regulations, and Acts produced overly strict controls which may reflect their view that strict controls might thwart effective international trade, and relationships. On the other hand, only 36 percent of the DoD responses indicated that this was an important problem which is in keeping with the goal of protecting national security interests possibly to the detriment of international trade.

The remaining problem of individual examiners instigating de facto policy is a problem of suboptimization which may never be totally removed. However, it is important to remember that this particular issue was raised by an officer who responded to a request to provide comment on additional problem areas, at the conclusion of question 27 of the survey.

The concerns expressed about combined FMS and technology transfer cases not receiving appropriate interdepartmental and intradepartmental review were identified solely from the literature and confirmed by an anonymous source within the technology transfer system described in Figure 5.

Some recommended actions to combat these problems are prescribed in the final chapter.

VI. Conclusions and Recommendations

Conclusions

The research established that a significant difference does exist between the attitudes of U.S. and Australian officials on policy matters concerning the development and implementation of U.S. technology transfer policy.

Identifying who the players were in the U.S. technology transfer policy system was an important precursor before proceeding with the research into the difficulties experienced by Australia. The Defense Technology Security Administration (DoD), Office of Munitions Control (Department of State), and the Office of Export Licensing (Department of Commerce) were the major players within the trilateral partnership which coalesces the actions of west-to-west military technology transfer system.

The difficulties within the technology transfer system, are a function of the systems complexity, uncertainty and constant changes. The U.S. system is driven primarily towards preventing technology outflow to the Soviets which does not easily accommodate the cooperative exchanges with allied nations envisaged in other U.S. policies such as RSI.

The nature of the system fosters a complex set of policies which are driven by six factors: first, the vast number of technologies earmarked as having potential military application; second, the sophistication and array of advanced technology stemming from both commercial and military research that are available for military use; third, the need to balance national security and foreign policy objectives with those ocncerning international trade which are embedded in policies fragmented between the three principal departments; fourth, the vast number of regulatory instruments necessary to control technology transfer and export licensing; fifth, the lack of direction of U.S. policy, particularly for U.S. industry and allied nations; and sixth, the limitless transfer mechanisms that the policy is designed to oversee to prevent the disclosure of strategic technology to proscribed nations.

The Difficulties for Australia. The difficulties that arise for Australia are not likely to be unique to Australia, but probably are experienced by most allied nations. This is because the differences are largely related to the elements of the west-to-west military-related technology transfer system. Six areas of difficulty were identified in this study which impact on Australia. First, the six factors which contribute to the complexity of the system, presented above, make

it difficult to understand the policies, and procedural aspects of the system.

Second, the poor interaction which occurs between the three primary departments causes suboptimization of technology transfer goals because of the specific departmental objectives. In the case of the Department of Commerce, international trade is paramount, Department of State concerns itself with both foreign policy and national security objectives, where DoD is solely directed towards national security considerations. However, the greatest divergence seems to occur between DoD and Commerce.

Third, consistent with the above point are the divergent views held by the various departments on key policy issues. This causes confusing and inconsistent decision making which provides little assistance and guidance for allied nations.

Fourth, de facto policy making by technical examiners who review particular cases often leads to inconsistent decisions which do not allow precedents to be established for future cases, despite the guidance reviewing officers obtain from the MCTL and the NDP.

Fifth, improper technology transfer reviews afforded FMS cases by formally restricting the review process to the cognizant military department invariably means incomplete consideration of the case.

Sixth, the divergent attitudes which have been identified between U.S. and Australian officials may indicate a misunderstanding of the U.S. policy on the Australian's behalf, and a misunderstanding of Australia's requirements on the U.S. behalf. In either case, future approaches for the transfer of military technology transfer may be frustrated.

Finally, having classified versions of the MCTL and the NDP which are not releasable to foreign governments, means that those foreign governments may have to "second guess" U.S. decision makers.

Recommendations for Technology Transfer Action

For a small ally like Australia, altering the system is virtually impossible. Past changes were born out of U.S. Government reaction to U.S. industry dissent or major diversions to the Soviets. To combat the difficulties encountered for Australia a number of steps are recommended.

First, all Australian officials involved in acquisition programs should be more familiar with U.S. technology transfer and export license policies, procedures, and organizations involved, and correct points of access to the system. This may best be achieved by educational programs within the Australian DoD, and by taking full

advantage of the expertise in this area available from the staff of DISAM.

Second, greater emphasis needs to be devoted to technology transfer issues in the acquisition project management function within the Australian DoD. Foreign Military Sales cases should clearly define the military technology requirements when requests are made for Price and Availability data prior to the development of the Letter of Offer and Acceptance. Proficiency in this area may be enhanced by the suggested training scheme.

Third, FMS cases or any other request for the transfer of military technology from Australia should be accompanied by the most detailed justifications. These justifications should make reference to such items as the guidelines available in the unclassified version of the MCTL; safeguards that will be afforded that technology; end-user detail; strategic implications of the transfer; benefits that the U.S. will derive from the transfer; economic impact of the transfer; where applicable, offer the U.S. Government or industry, Australian developed technology on a quid pro quo basis; and the significance of the transfer with respect to other relevant U.S. defense policies.

Fourth, the Australian Government might consider an MOU on technolog, transfer which may improve the chance of obtaining the desired technology; reduce the task of lengthy justifications each time technology is required;

and clarify the players in the system, procedures, and appropriate organizational points of contact in the system.

Fifth, the Australian DoD should consider canvassing the U.S. DoD to widen its review process for FMS cases, so that incorporated technology transfer issues are given proper formal consideration within the west-to-west military technology transfer system, and not restricted to the cognizant military department.

Finally, if the Australian acquisition program management evaluation reveals that there is little likelihood of acquiring the desired technology from the U.S., other sources of foreign availability should be seriously considered.

Recommendations for Further Research

The problems associated with the transfer of technology between the U.S. and Australia are not likely to diminish, and may be expected to increase. As a result, continued academic research would be beneficial in this area of endeavor. For example, future studies might be directed towards developing a set of constructs which more fully and accurately measure the critical aspects of technology transfer. Consideration might also be given to conducting a second study to examine whether any changes occur over time in the attitudes between the two countries on the development and implementation of the U.S. policy on technology transfer.

Appendix A: Acronyms

ADF	Australian Defence Force
ACDA	Arms Control Disarmament Agency
AECA	Arms Export Control Act
AFIT	Air Force Institute of Technology
ANZUS	Australia, New Zealand, and United States Defense Treaty
AS/EA	Assistant Secretary Export Administration
ASEAN	Association of South East Asian Nations
CCL	Commodity Control List
COCOM	Coordinating Committee for Multilateral Export Controls
DISAM	Defense Institute of Security Assistance Management
DoD	Department of Defense (or Defence)
DSAA	Defense Security Assistance Agency
DTSA	Defense Technology Security Administration
EAA	Export Administration Act
EBA	Office of Economic and Business Affairs (Department of State)
FMS	Foreign Military Sales
IP&T	Deputy Under Secretary International Programs and Technology (U.S. DoD)
ISA	Assistant Secretary International Security Affairs (U.S. DoD)
ISP/EUR	Assistant Secretary International Security Policy, Europe (U.S. DoD)
ITAR	International Traffic in Arms Regulation
IT^2	International Technology Transfer Panel (U.S. DoD)
MCTL	Military Critical Technology List
MOU	Memorandum of Understanding
NATO	North Atlantic Treaty Organization
NDP	National Disclosure Policy
OEL	Office of Export Licensing (Department of Commerce)
OJCS	Office of the Joint Chiefs of Staff (U.S. DoD)
OMC	Office of Munitions Control (Department of State)
PM	Bureau of Politico-Military Affairs (Department of State)
PM/STA	Bureau of Politico-Military Affairs, Office of Strategic Technology Affairs (Department of State)
R&E	Under Secretary for Research and Engineering (U.S. DoD)
RSI	Rationalization, Standardization and Interoperability
SAS&T	Under Secretary for Security Assistance and Science and Technology (Department of State)
SDIO	Strategic Defense Initiative Organization (U.S. DoD)

SIG/TT	Senior Interagency Group on the Transfer of Strategic Technology
U.S.	United States of America
US/A	Assistant Secretary for Acquisition (U.S. DoD)
USD (P)	Under Secretary for Defense Policy (U.S. DoD)

Appendix B: Memorandum of Understanding on Logistic Support

MEMORANDUM OF UNDERSTANDING ON LOGISTIC SUPPORT BETWEEN THE GOVERNMENT OF AUSTRALIA AND THE GOVERNMENT OF THE UNITED STATES OF AMERICA

BACKGROUND

1. Basic security relationships between the United States and Australia (hereafter referred to as the Parties) are contained in the Australia, New Zealand, United States (ANZUS) Treaty signed on 1 September 1951. This Memorandum of Understanding (MOU) supports ANZUS security objectives. The United States has a strong interest in the defense capabilities of Australia and New Zealand. The supply and support of defense materiel by the United States makes an important contribution to the capacity of the Australian Defence Force for self-reliant combat capability and thus to the achievement of broad ANZUS interests in the region.

2. The Australian Defence Force is equipped with a wide range of advanced technology weapon systems of United States origin. The uninterrupted supply and other logistic support of these items is essential to the operational effectiveness of the Australian Defence Force.

3. In conjunction with Australian purchase of modern weapons systems and equipment from the United States, arrangements have been made for peacetime supply and support of the items by the United States[1]. These arrangements do not provide specifically for additional support for war or other contingency.

PURPOSE

4. The purpose of this MOU is to set forth policies and guidelines for provision of logistic support to the Australian Defence Force by the United States and to the United States Armed Forces by Australia during peacetime, during periods of international tension or in circumstances of armed conflict involving either or both Parties.

BASIC SUPPORT POLICY

5. The Parties recognize that their national and collective capacity to resist armed attack relies in large measure on the establishment and maintenance in peacetime of defense forces equipped with effective weapons and of plans and arrangements for the timely expansion of those forces should the need arise. Their common interests will be advanced with a clear understanding between them about the continued availability to Australia from the United States of defense articles and services in situations extending from peacetime through circumstances of armed conflict. A continuing need also exists for mutual arrangements of cooperative exchange of data, research, development, production, procurement and logistic support.

Footnote: 1. Cooperative Logistic Arrangement Relating to the Supply Support of the Armed Forces of Australia by the United States Department of Defense (1965).

6. The Parties further acknowledge that practical measures to enhance the foregoing objectives should be consistent with the broad aims of their respective defense policies. Australia, although heavily dependent upon an extensive range of defense articles and services procured and supported from the United States, will continue to seek to enhance its independent capacity to produce and support defense materiel. To this end also Australia will continue to seek particular conditions of purchase and offsetting orders in the case of major equipment purchases which may be negotiated under separate arrangements.

7. Subject to the provisions of the United States Arms Export Control Act, as amended, International Traffic in Arms Regulations, and related United States legislation and policies, the United States accords Australia the status of an eligible purchasing country who may procure defense articles and services either from United States Government or commercial sources. Australia is also included in the list of nations that are extended special waivers of certain restrictions under the legislation. It will be important to the basic support policies outlined in paragraphs 5 and 6 above that this status be sustained.

SUPPORT ARRANGEMENTS - PEACETIME

8. Subject to the legislation and policies referred to in the preceding paragraph, the United States will make available to Australia in peacetime, defense articles and services which are mutually determined by the Parties. The defense articles and services will include:

(a) Weapons systems and equipments;
(b) Spare parts for weapons systems and equipment and other support items;
(c) Munitions, ammunition and other explosives;
(d) Modification kits;
(e) Test equipment;
(f) Manufacturing tooling, specialized materials and advice;
(g) Manufacturing data;
(h) Publications and film;
(i) Technical Data Packages;
(j) Technical assistance services;
(k) Training;
(l) Repair services;
(m) Transportation services; and
(n) Contract Administration services.

9. The defense articles and services which the United States will provide to Australia in peacetime will include those arranged under the Cooperative Logistic Supply Support Procedures contained in Annex A to this MOU. Australia will have direct access to support items from the United States Defense Logistics System in accordance with those supply support procedures.

SUPPORT ARRANGEMENTS - OTHER THAN PEACETIME

10. Subject to its laws and regulations and the exigencies of war, the United States will continue to provide logistic support materiel and services of the kind described in paragraph 8 to Australia during periods of international tension or in circumstances of armed conflict involving either or both Parties. Such United States support could include the following elements if needed:

(a) Supply and maintenance support of weapon systems and equipment of United States origin that are in the inventory of the Australian Defence Force. Peacetime support arrangements would be expanded to increased levels required to meet the contingency.

(b) Supply of additional weapons systems and equipment required for expansion of the Australian Defence Force and to replace combat losses.

(c) Supply of high technology munitions such as torpedoes, missiles and other explosives that are not produced in Australia.

(d) Assistance to Australia in activation and expansion of the Australian defense production base to produce selected items of equipment, spare parts and munitions of United States origin.

(e) Provision of, or assistance with, transportation of defense articles from United States sources to the Australian Defence Force.

(f) Cooperative planning for pre-positioning of stocks in Australia. Such planning may relate to stocks for replenishment of United States and allied forces as mutually arranged by the Governments of the United States and Australia.

(g) Assistance in direct arrangements between Australia and the United States industry for support of weapons, systems and equipments not initially acquired through government-to-government arrangements.

(h) Assistance in support of weapons and equipment of United States origin that are no longer standard with United States forces.

(i) Provision of cataloguing and technical data, manufacturing information and training material to assist Australia in enhancing its internal logistic support capability for defense articles of United States origin.

PROCEDURES

11. (a) Supply Support - Existing peacetime Cooperative Logistics Supply Support Arrangements (CLSSAs) between the United States and Australia will continue in force during periods of international tension or in circumstances of armed conflict involving either or both Parties. Quantities of material requisitioned may be increased to meet demands. Such increases will be subject to materiel availability, procurement/production leadtimes and competing requirements/commitments of the United States Armed Forces unless action is taken in advance to provide for Australian capitalization of additional stocks in the United States logistic system.

(b) Weapon Systems and Munitions - During periods of international tension or in circumstances of armed conflict involving either or both Parties, the United States will endeavour to continue the delivery of all weapons, equipment and munitions that have been ordered by Australia under Foreign Military Sales. Subject to its laws and regulations, the United States will also receive and endeavour to fill orders for additional weapons and munitions required by Australia consistent with United States requirements for the same materiel. If Australia desires to have selected items of weapons and munitions available in advance of normal leadtimes, these should be the subject of special FMS arrangements to be worked out as far as practicable in peacetime. Options include measures such as prestockage, advance procurement of long leadtime components, and use of substitute items.

(c) Other Support - To the extent that Australia anticipates requirements for the United States to provide other logistic support such as airlift, sealift, maintenance or storage, these needs should be identified and advance planning accomplished as far as practicable in peacetime.

PRIORITIES

12. Australia is included in the Uniform Materiel Movement and Issue Priority System of the United States Department of Defense. Force/Activity Designators (FAD) are assigned under this system by the United States Joint Chiefs of Staff (JCS). FADs will be adjusted as appropriate during periods of international tension or in circumstances of armed conflict involving either or both Parties. In assigning FADs to the Australian Defence Force, the United States Joint Chiefs of Staff will take into account any views on priorities communicated to the United States Department of Defense by the Australian Department of Defence and will be guided by Annex H of this MOU.

13. With regard to Australian purchases of United States origin defense articles and services through direct commercial channels, the United

States will make its best endeavours to ensure that delivery to Australia is in accord with the timetable required by Australia insofar as consideration of export licenses and transportation services are concerned. Where this cannot be achieved there will be consultation between the United States Department of Defense and the Australian Department of Defence to explore alternative means for meeting the Australian need.

FUNDING

14. All materiel and services provided to Australia by the United States Department of Defense under this MOU will be priced on a fully reimbursable basis as required by the United States Arms Export Control Act as implemented by appropriate US Department of Defense publications. However, provision of cooperative military airlift by one government to the other will be in accordance with the pricing and other terms and conditions stipulated in Annex G of this MOU. All materiel and services provided to the United States by Australia under this MOU will also be priced on a fully reimbursable basis. Charges to the United States Government for any articles or services rendered will be no more than the actual costs to Australia plus administrative and accessorial charges not in excess of the percentages assessed by the United States Government when furnishing similar supplies and services to Australia.

RECIPROCAL LOGISTIC SUPPORT

15. Subject to United States laws and regulations and the exigencies of war, the United States will make its best endeavours to provide assistance sought by Australia to facilitate cooperative logistic support actions between countries in the Southwest Pacific area.

16. Subject to its laws and regulations, policies and the exigencies of war, Australia will make its best endeavours to provide to the United States any defense articles or services of the nature described in paragraph 8 which the United States might seek from Australia. This could include the repair/refit and maintenance of United States ships, aircraft and equipment in Australia. It could also include supply to United States forces of general supplies, replenishment items of United States design produced or available in Australia, and Australian defense articles in United States service.

CO-ORDINATION

17. Australia will provide the United States the maximum practicable notice of its requirements. The United States will provide Australia with the maximum practicable notice of its intentions for the development, production, introduction into service, support and eventual disposal of military equipments of potential interest to the Australian Defence Force. To facilitate this the United States and Australia will establish joint machinery for the regular review of equipment plans and programs of potential joint interest.

18. The Minister for Defence of Australia and the Secretary of Defense of the United States will each appoint a central point of contact for implementation of this MOU. The points of contact will assure preparation and issuance of necessary implementing instructions to the military services of both nations. Review meetings will be held at least once each year to assess progress, resolve problems, discuss issues, and update plans for future actions.

IMPLEMENTATION

19. This MOU including Annexes will come into force on the date it is signed by both Parties. This MOU will supersede the Logistic Arrangement between the Government of the Commonwealth of Australia and the Government of the United States of America dated 9th February 1965, the Cooperative Logistics Arrangement Relating to the Supply Support of the Armed Forces of Australia by the United States Department of Defense dated 9th February 1965, and the Memorandum of Understanding on Logistics Support between the Government of Australia and the Government of the United States of America dated 18 March 1980.

20. Procedures and tasks that are required to implement this MOU may be undertaken by the Australian Department of Defence, including the three Australian Armed Services, with the United States Department of Defense or a particular United States Military Service. Jointly determined arrangements to implement this MOU will be added as further Annexes. A list of current Annexes is attached.

Review and Termination

21. This MOU and its Annexes will continue in force for a period of five years from the date of signature and may be renewed for a further period upon mutual consent of both Parties. The MOU or any Annex may be amended by an Exchange of Letters between the Parties and may be terminated by either Party giving the other Party not less than 180 days written notice.

For and on behalf of the Government of the United States

Caspar W. Weinberger
Secretary of Defense 30 MAR 1985

For and on behalf of the Government of Australia

Kim C. Beazley
Minister for Defence 23 APR 1985

Dated this _____ day of _____.

ANNEX A

COOPERATIVE LOGISTICS SUPPLY SUPPORT PROCEDURES

I. PURPOSE

The purpose of these Procedures is to enable the Armed Forces of the Government of Australia, within the terms of the Arms Export Control Act and related or successor legislation, and in accordance with DoD implementing regulations, to use the organization and facilities of the United States Defense Logistics System to support Australian military equipment specified by Australia and common to the Armed Forces of the two Governments on a basis which:

A. Will permit Australia to obtain logistic materiel and services for its armed forces equivalent in timeliness and effectiveness to that provided United States Armed Forces within assigned Force/Activity Designators (FAD).

B. Will reimburse the United States for costs including accessorial/administrative charges incurred in providing such support to Australia in accordance with the provisions outlined below.

II. MATERIEL REQUIREMENTS

A. The determination of equipment to be supported by the United States will be made jointly by Australia and the United States on the basis of commonality of equipment between the armed forces of the two Governments and Australian assessments of its capacity to provide support from its own resources.

B. For such equipment, Australia will provide information to the United States on a timely basis to enable the United States to increase and maintain stock levels and on-order levels so as to assure support of the Australian Armed Forces equivalent to that provided US Armed Forces that have been assigned the same priority and FAD.

C. The initial determination of stock levels required to assure support for Australia will be made by the United States in consultation with Australia. Such determination will consider (1) information furnished by Australia on its planned usage of the equipment to be supported, (2) consumption experience data of the United States and (if available) of Australia, and (3) the calculation of pipeline days-of-supply tailored to the geography, lines of communication and requirements peculiar to Australia. These initial determinations will be modified subsequently in the light of experience.

D. The United States will provide appropriate technical assistance and advice as requested by Australia on Australian Foreign Military Sales Order I stock levels and on-order levels.

III. ORDERS

Foreign Military Sales Orders (FMSO) covering stockage, consumption and storage are necessary. Two FMSO cases are required: Foreign Military

Sales Order (FMSO) I and Foreign Military Sales Order (FMSO) II. Both cases must be executed in order for FMS requirements to be anticipated and to be satisfied on an equal footing with US requirements.

A. Stock Levels. On the basis of the Article II determination and using established US procedures, Australia will place with the US Military authorities a Foreign Military Sales Order (FMSO I), covering the estimated dollar value and total initial agreed list of items and quantities to be stocked and maintained on order from procurement for the support of Australia's US-furnished equipment.

B. Consumption. Australia will place with the US military authorities a consumption FMSO (FMSO II), undefined as to items and quantities equivalent to a dollar amount of the estimated withdrawals of materiel from the Supply system for the jointly determined period (normally one year) and funded quarterly. Prior to the beginning of each quarter, payments will be made in accordance with mutually decided to procedures to cover that quarter's anticipated withdrawals.

C. Revisions to FMSOs. 1. After the development of sufficient demand history, FMSO I will be revised to include those items required, based upon Australia's usage experience, to be in the US pipeline.

2. Provision will be made for the updating of FMSO I to assure stockage of all items essential to the proper maintenance of major equipment.

3. In the event Australia reduces its FMSO I coverage, future requests for such items will not be handled as a requisition subject to this procedure.

4. The FMSO II will fund storage fees including normal inventory losses on other than stock funded items. These fees are based on the on-hand portion of the FMSO I.

5. The FMSO II will be closed on 30 September each year, at which time a new consumption Sales Order will be established, based on demand history or planned operations.

IV. REQUISITIONS AND ISSUES

A. Australia will forward requisitions for standard materiel items, using US Military Standard Requisition and Issue Procedure (MILSTRIP), to the designated Military Service Requisition Control Office (RCO). Non-standard materiel items may be requisitioned upon the consent of the Military Department concerned.

B. Stock requisitions will be issued from supply points within the US military system. Title to equipment and materiel will pass to Australia at the initial point of shipment or origin unless otherwise specified in the Letter of Offer and Acceptance (DD Form 1513).

C. Australia is responsible for the cost of transportation from the point of shipment or origin, unless otherwise specified, to final destination. Documents and procedures used by the US for invoicing and issuing will be

compatible with those used by the US Armed Forces. After storage levels have been established, invoices will be computed utilizing the "Standard" US military price prevailing at the time requisitioned items are issued from the US inventory with an appropriate surcharge, where applicable or where a waiver has not been granted, to recover applicable Department of Defense asset use and non-recurring recoupment charges.

V. SUPPORT PRIORITY

A. Requisitions placed by Australia with the US supply system before US stock levels have been increased, or for items not included in FMSO I, will be filled from procurement or from existing stocks to the extent that inventory levels are adequate to permit supply without detrimental effect on support of prior commitments of US Forces (i.e., when such issues will not reduce levels below the re-order point). Pricing will be in accordance with DoD 7290.3M, Foreign Military Sales Financial Management Manual.

B. Upon attainment of the increase of US stock levels, referred to in Article IIIA, support for FMSO I items will be provided to Australia with the same responsiveness as for equivalent US forces in equivalent operational circumstances. Australia will assist in the verification of high priority requirements submitted by Australian forces when such verification is requested by the US. In all circumstances Australia will have the status of a favoured customer of the United States.

C. When US stock levels are insufficient to meet Australian demands, because of Australian reduction of US proposed levels (Article IIIC), requisitions will be filled in the same manner as those referred to in paragraph VA, above.

VI. STORAGE AND MODIFICATION

A. Australian stocks of materiel held in the US system will not be physically separated or otherwise physically identified.

B. The quality and description of materiel furnished by the US to Australia will be identical in all respects to that furnished to the US Armed Forces, including all maintenance and modification work which normally will be accomplished before materiel is issued. In those cases where materiel previously issued requires modification, Australia may at its own option order the required modification kits in accordance with normal FMS procedures.

VII. OBSOLETE AND EXCESS STOCKS

A. If an item becomes obsolete or excess to Australian but not to US requirements, Australia may request cancellation of the FMSO I item. If the US agrees to the cancellation, appropriate action will be taken by the US to cancel the FMSO I item and apply the equity to subsequent requirements for other items or to return the 5/17 investment to Australia. If the US does not agree to the cancellation, Australia will, upon request, withdraw the quantity, or arrange for the US to dispose of such materiel with the net proceeds to be credited to the Australian account. If Australia has additional stocks in country which are excess to its need, Australia will have the option of reporting these excesses to the appropriate Military Department via the Materiel Returns Program (MRP) procedures contained in MILSTRIP. If the US desires

Australia to return the materiel under the MRP, appropriate credit to Australia's trust fund account will be made in accordance with Department of Defense procedures.

B. If an item listed in a FMSO I becomes obsolete or excess to US but not Australian requirements, the US may request Australia to withdraw its materiel equity from U.S. stocks. Australia may purchase additional quantities of such items from existing US stocks at a fair value to be jointly determined in accordance with applicable regulations. Australia may, with the approval of the US, place a final order for spares in sufficient range and quantity to support the equipment for its probable remaining useful life. Military Departments will alert Australia to anticipated US equipment phase-outs to permit a timely and orderly final procurement of spares.

C. If an item becomes obsolete or excess to the requirements of both Australia and the US, Australia will, upon request, withdraw its materiel from US facilities. Alternatively, at the request of Australia, the US will dispose of such materiel in accordance with current US DoD procedures and credit Australia with its proportionate share of the net proceeds.

VIII. REPURCHASES

Upon request of the US, Australia will, to the extent compatible with its supply requirements, sell to the US items which have been previously delivered under these Procedures. Such repurchases will be made at a fair price to be jointly determined in accordance with applicable regulations which will not in any case exceed the price at which the item was sold to Australia, plus the cost of any modification and accessorial charges. Transportation in such cases will be furnished by the US.

IX. UNUSUAL STOCK LOSSES

Stock losses due to enemy action, major disaster, or other casualty from a natural phenomenon will be assessed against Australia in an amount proportionate to the ratio that the value of its stock case bears to the total value of like stocks in storage. Charges submitted under this provision will include a certification that such losses were not due to fault or negligence of US personnel.

X. EXPANSION OF FACILITIES

Any additional capacity needed to accommodate stocks ordered by Australia under this Procedure may be provided by arrangement between the US and Australia for the expansion of US facilities at Australian expense. If it is not possible to reach joint determination on all aspects (including financing) of such expansion of US facilities, the US supply commitment will be limited to fulfilling requirements within the available capacity of existing US facilities. Any such limitation in US supply capability will be clearly established at the time of US acceptance of the FMSO I specified at Article IIIA, and amendments thereto, or as soon as practicable thereafter as such limitations become evident to the US.

XI. FUNDING

A. The FMSO I case is sub-divided into two parts: Part A, an on-hand portion representing five months of inventory; and Part B, an on-order dependable undertaking which provides the obligational authority necessary to award the contracts required to support Australia through the normal 12 months administrative and procurement lead times. Australia is to pay a cash amount equal to the on-hand portion 5/17 of the total materiel value of the case, upon acceptance of the FMSO I. In unusual circumstances it may be determined that the 5 month on-hand and 12 month on-order are inappropriate for the particular equipment being supported. In this instance the specified levels may be adjusted. A nonrefundable administrative charge (currently 5% of the 5/17 value) will be added to the billing for the on-hand quantity; the 5% administrative charge will be assessed on any increase in FMSO I value. Neither materiel nor administrative charges will be assessed against the on-order materiel until that materiel has been delivered to the US supply system in a terminal transaction. Charges for storage will based on the Part A, on-hand, portion (currently 1.5% of the FMSO I 5/17 value). Charges for normal inventory losses will be computed on a pro-rata basis.

B. Periodically, the FMSO I will be financially updated in accordance with the individual US Service's procedures. The materiel value, 5/17 investment and administrative charge will be adjusted to reflect current requirements and prices.

C. The FMSO II case represents Australia's anticipated yearly consumption under these Procedures. Australia is to pay cash in advance of each quarter to cover requisitions placed during that quarter. An administrative surcharge (currently 3%) will be charged on requisitions processed under FMSO II cases.

D. Cash and obligation authority derived from the FMSO I and FMSO II cases will be used by the supporting US Service to increase stock and on-order quantities in anticipation of requisitions being placed on the Service by Australia.

E. Subject to the foregoing, billing and collection will be in accordance with the normal US Foreign Military Sales procedures.

XII. SPECIAL SUPPORT

A. The forces of each of the two Governments will provide unanticipated support to the forces of the other to the extent that such support requirements can be met.

B. Should there be occasions when Australia desires short term sustained support from United States operational locations and the United States is in a position to provide such support, special arrangements will be separately negotiated between representatives of the using forces of the two Governments.

XIII. EFFECTIVE DATE AND TERMINATION

A. During the period between the notice of termination and the termination date, Australian requisitions, if any, will be submitted in the

normal manner. All requisitions submitted by Australia and accepted by the US prior to the termination date will be filled by the US in the normal manner regardless of whether the termination date will have passed. Subject to the filling of such requisitions, the provisions of Article VII will apply after the termination date to the disposition of the Australian equity in the undelivered quantity of each common item covered by these Procedures.

B. In the event of termination of these Procedures, Australia and the US will negotiate a fair residual value settlement for those installations or major improvements financed by Australia under Article X above, to the extent that such facilities are required for the US Government.

PROCEDURES FOR REQUEST BY AUSTRALIA FROM THE UNITED STATES OF WEAPONS AND MUNITIONS IN ADVANCE OF NORMAL LEADTIMES

I. PURPOSE

To outline procedures by which, when mutually arranged by both parties, the Armed Forces of the Government of Australia will receive from the United States, deliveries of selected weapons and munitions in advance of leadtime normally applying.

II. APPLICATION OF PROCEDURES

These procedures will apply, subject to the provisions contained in the US Arms Export Control Act, during periods of international tension, or in circumstances of armed conflict, or for other reasons, when Australia and the US mutually determine that weapons and munitions are required in advance of leadtimes which would apply under normal peacetime procedures.

III. CONSULTATION

When assessing its requirements in the light of Section II above, Australia will consult with the United States regarding changes to Force/Activity Designators, prestockage, advance procurement of long leadtime items, use of substitute items or other alternative means by which delivery of weapons and munitions may be advanced. Consultations will be conducted between the Armed Services of the two countries under existing arrangements.

IV. ALTERNATIVE PROCEDURES

For each weapon or munitions item mutually arranged for advance delivery, the United States will consider the following options:

A. For materiel for which Australia has negotiated a current FMS case with a United States Service, the United States may provide Australia's requirements from its inventory and replenish US inventories from later deliveries which had been intended to fill the Australian order. For materiel not available direct from the inventory of a United States Service, the United States will use its best efforts to arrange for priority delivery to Australia of the items from the contractor.

B. For materiel for which no FMS case has been negotiated, Australia will initiate an appropriate request for an FMS case which, if and when accepted and implemented, the United States will, to the extent consistent with its own priority requirements and commitments, sell the items to Australia, from its inventory. Alternatively, the United States will use its best efforts, under standard FMS procedures and consistent with other priorities and commitments to arrange production of the materiel in a time frame consistent with Australia's requirement.

C. Should neither of the above options be practicable, Australia and the United States will consult concerning alternatives which might meet the Australian requirement. Arrangements for supply will be in accordance with the US Arms Export Control Act.

D. Should a need arise for advance deliveries of items not covered under a Cooperative Logistic Supply Support Arrangement, Australia will negotiate with the United States for increased holdings of the items in the United States inventory to meet future possible Australian requirements.

V. POINTS OF CONTACT

A. Australia

First Assistant Secretary
Technical Services and Logistic Development
Department of Defence
Canberra ACT 2600

B. United States

OASD (International Security Affairs)
Pentagon
Washington DC 20301

ANNEX C

ARRANGEMENT TO FACILITATE COOPERATIVE LOGISTIC SUPPORT BETWEEN AUSTRALIA AND OTHER COUNTRIES IN THE SOUTHWEST PACIFIC AREA

I. PURPOSE

The purpose of this Arrangement is to set forth the types of assistance the US may provide to Australia to assist cooperative logistic support between Australia and other countries in the Southwest Pacific area.

II. ELIGIBLE SOUTHWEST PACIFIC COUNTRIES

A. Those Southwest Pacific countries to which the US Government would itself sell defense articles through the US Foreign Military Sales program are generally considered eligible for receipt of items produced by Australia, based on production agreements with the US DoD or US commercial sources.

B. The US DoD will provide advisory opinions regarding the prospect of USG approval of the transfer by Australia to eligible Southwest Pacific countries of such US Defense Items. The main intent of this review will be to identify to Australia those items and/or countries for which the USG would be unable to consider such transfer.

III. AUTHORIZED ITEMS

A. Consistent with the provisions of the arrangements with the US DoD, or with US commercial sources, for Australian production of US Defense items, Australia may request, on the basis of an annual forecast of items, quantities and recipients, on a case by case basis, US authority for transfers to or within third countries.

B. Proposals for transfer will be identified to the Defense Security Assistance Agency and the US Department of State, and will include the following information:

1. Recipient countries.

2. Items/quantities/original FMS price (if applicable).

3. Source of original production authorization.

4. Reasons for the proposed transfer.

IV. APPROVAL OF THIRD COUNTRY TRANSFER

A. Where applicable, the US Department of State will notify the US Congress, and obtain any required assurances from the intended recipient with regard to the end use of the item and any further transfer thereof.

B. The US DoD will notify Australia of the results of third party transfer requests.

V. POINTS OF CONTACT

A. Australia

First Assistant Secretary
Technical Services and Logistic Development
Department of Defence
Canberra ACT 2600

B. United States

OASD (International Security Affairs)
P ıtagon
Washington, D.C. 20301

ANNEX D

PROCEDURES FOR THE EXCHANGE OF INFORMATION OF EQUIPMENT PLANS AND PROGRAMS OF POTENTIAL JOINT INTEREST

I. PURPOSE

A. To outline procedures to identify mechanisms for exchange of information concerning equipment plans, programs and logistic requirements.

B. The aim of these Procedures is to ensure, consistent with the security needs of both countries and in accordance with the statutes and regulations of each country, that sufficient data are made available to both parties to implement the intent of this MOU to the extent that:

1. Australia will provide the United States with maximum practicable notice of its requirements.

2. The United States will advise Australia to the maximum extent practicable of its intentions for the development, production, introduction into Service, support and disposal of military equipment of potential interest to the Australian Defense Force.

3. Information or data exchanges under this Annex will be confined to routine information and will not include technology transfer and/or transfer of other proprietary information.

II. USE OF ESTABLISHED LINES OF COMMUNICATION

To the extent practicable, information exchange for equipment plans, programs and logistic requirements will be conducted through the medium of currently established formal agreements and other established machinery for mutual discussions. These media include, but are not limited to:

A. Defence/Defense Talks conducted under the Barnard/Schlesinger arrangements.

B. US/Australian Joint Staff and Service-to-Service Talks.

C. The ABCA Standardization Agreement.

D. The Technical Cooperation Program

E. The Mutual Weapons Development Data Exchange Agreement.

F. Upon specific request by Australia to exchange information.

III. COORDINATION OF REVIEW ACTIVITIES

Australia and the United States will establish internal mechanisms to:

A. Identify those activities under the various agreements referred to in II above which impact on the implementation of the MOU and which warrant policy consideration/discussion at joint meetings.

B. Prepare official positions on matters of joint interest for presentation and discussion at joint meetings.

C. Disseminate information and arrange for implementation of decisions flowing from joint meetings.

D. Mutually determine the appropriate forum, specific subject matter, and representation for joint discussions.

IV. POINTS OF CONTACT

A. Australia

1. For Service-to-Service and Joint Staff Forums:

Chief of Joint Operations and Plans
Department of Defence
Canberra ACT 2600

2. For other Forums:

Chief of Supply and Support
Department of Defence
Canberra ACT 2600

B. United States

OASD (International Security Affairs)
Pentagon
Washington DC 20301

ANNEX E

TECHNOLOGY TRANSFER

I. PURPOSE

To outline procedures whereby the United States may facilitate transfer of defense technology of US origin permitting Australia to enhance its independent capacity to produce and support defense materiel.

II. GENERAL ARRANGEMENTS

Subject to the provisions of relevant legislation, and to mutual agreement between the two parties on a case by case basis, the United States will facilitate transfer of appropriate technology to Australia to permit Australia to support defense equipment purchased from the United States. Technology transfers and other USG assistance made expressly under this Annex (e.g., facilitation of negotiations) will be as concluded in Letters of Offer and Acceptance (LOAs) negotiated according to the US Arms Export Control Act and other applicable Defense Policies. It is further understood that USG undertakings to employ best efforts to assist Australia in negotiations do not obligate the USG to intervene in private sector matters where inappropriate.

III. NEW MATERIEL PURCHASES

A. As part of any purchases of new materiel by Australia, the US will, consistent with legislative requirements and applicable defense policies, transfer technology enabling Australia to achieve a mutually acceptable level of self-sufficiency in support of the materiel being purchased.

B. Technology transfer arranged under A above will include:

1. Release to Australia of those technologies for which unlimited rights are held by the US Government.

2. Use of best efforts to assist Australia in negotiations with US firms to transfer those technologies for which the US Government does not have unlimited rights.

IV. EQUIPMENT REMOVED FROM THE US DEFENSE INVENTORY

A. When equipment is removed from the active United States defense inventory, all technology incorporated in that equipment will, to the extent practicable and as mutually arranged between the parties, be made available for transfer to Australia to facilitate continued support of Australian-owned equipment.

B. To this end, consistent with legislative requirements and applicable Defense policies, the United States will, subject to mutual arrangement between both parties, release to Australia those technologies for which the US Government has unlimited rights and use best efforts to assist Australia in negotiations with US firms to transfer, on request, those technologies for which the US Government does not have unlimited rights.

V. POINTS OF CONTACT

A. Australia

First Assistant Secretary
Defence Industry and Materiel Policy
Department of Defence
Canberra ACT 2600

B. United States

OASD (International Security Affairs)
Pentagon
Washington DC 20301

PROCEDURES FOR REQUEST BY AUSTRALIA FOR ASSISTANCE IN ACTIVATION AND EXPANSION OF THE AUSTRALIAN DEFENSE PRODUCTION BASE DURING PERIODS OF INTERNATIONAL TENSION OR IN CIRCUMSTANCES OF ARMED CONFLICT

I. PURPOSE

The purpose of this Annex is to outline procedures by which, when mutually arranged by both parties, the United States will provide assistance to Australia in activation or expansion of the Australian Defense production base as necessary to produce selected items of equipment, spare parts and munitions of United States origin, during periods of international tensions or in circumstances of armed conflict involving either or both parties.

II. SCOPE

These procedures will cover such equipments, spare parts and munitions of United States origin, as may be mutually arranged by both parties on a case-by-case basis, which are presently included in the inventory of the Australian Defence Force, and such materiel which Australia may acquire in the future from the United States.

III. ACTIVATION OF PROCEDURES

A. Activation and expansion of the Australian industrial base may be required when materiel cannot be made available from United States sources in the quantities and time frames sought by Australia, or when otherwise arranged between the parties.

B. Consonant with Australia's stated intention to continue to seek to enhance its independent capacity to produce defense materiel (paragraph 8 of the MOU refers), the processes provided for in this Annex may be tested during peacetime against selected materiel so that the potential ramifications of a more general activation of these processes can be monitored by both parties.

C. The procedures outlined in this Annex may, as arranged between the parties, be amended from time to time in the light of the practical experience of peacetime activities.

IV. TECHNICAL AND MANUFACTURING ASSISTANCE

A. For specific items included in the range of materiel covered by Clause II above, the United States will provide assistance to enable their production in Australia. FMS procedures will be used to transfer technical data and services under Government-to-Government Agreements and Arrangements between the United States and Australia. Should such data or services be authorized for transfer to Australia on a direct commercial basis, the US Department of Defense will use its best efforts to facilitate appropriate licenses. Types of assistance may include:

1. Technical data packages;

2. Manufacturing data;

3. Test procedures;

4. Technical assistance services;

5. Training; and

6. Access to sources of specialized manufacturing tooling, plant, and test equipment.

B. Where the provision of such assistance involves limited rights data, the United States will, when mutually arranged between the parties, use its best efforts:

1. To permit timely Australian access to data, equipment and services to which the United States has rights; and

2. To facilitate negotiations toward timely Australian access to data, equipment, and services to which the United States does not have unlimited rights.

V. LICENSE AND ROYALTY FEES

A. The United States will, as mutually arranged between the parties on a case-by-case basis, waive license and royalty fees associated with the manufacture in Australia for use by Australian Forces of those United States-designed defense items for which the United States Government owns the right to use the technical data without incurring liability to others.

B. For those defense items of US design for which the US Government does not own the right to use the technical data without incurring liability to others, the US Government will use its best efforts to assist the Government of Australia in keeping license and royalty fees to a minimum level.

VI. PRE-PRODUCTION AND PROOFING

The United States agrees that pre-production of mutually arranged quantities of specified items may be arranged between the parties in peacetime under the terms of these procedures, where Australia and the United States deem such pre-production is necessary for the purpose of proving Australian manufacturing facilities and capabilities exist to permit timely production during periods of international tension or in circumstances of armed conflict involving either or both parties.

VII. PROVISION OF UNITED STATES SOURCED MATERIALS

Where production of defense items of United States origin undertaken in Australia in accordance with this Annex requires the use of United States sourced materials or components, the United States agrees that orders placed by Australia will be assigned a priority based on the mutually agreed urgency of the request and consistent with the Force/Activity Designator.

VIII. FUNDING ARRANGEMENTS

The services and materiel provided to Australia by the United States under the procedures outlined in this Annex will be as concluded in Letters of Offer and Acceptance negotiated according to the US Arms Export Control Act.

V. POINTS OF CONTACT

A. Australia

First Assistant Secretary
Defence Industry and Materiel Policy
Department of Defence
Canberra ACT 2600

B. United States

OASD (International Security Affairs)
Pentagon
Washington DC 20301

ANNEX G

COOPERATIVE MILITARY AIRLIFT SUPPORT

I. PURPOSE

To outline the guidelines for mutual military airlift support of Australian and United States Defense Forces.

II. IMPLEMENTATION OF GUIDELINES

An Air Force-to-Air Force cooperative airlift arrangement will be negotiated within these guidelines for the mutual military airlift support of both defense forces. Such an arrangement will have reciprocal application for the transportation of the personnel and cargo of the military forces of the United States and Australia on aircraft operated by or for the military forces of those countries.

III. GUIDELINES

The arrangement will include, but not be limited to, the following terms:

A. The rate of reimbursement for transportation provided will be the same for each party and will be the rate charged to the military forces of the United States for airlift in the US Defense Transportation System.

B. Credits and liabilities accrued as a result of providing or receiving transportation will be liquidated not less than once every three months by direct payment to the country that has provided the greater amount of transportation.

C. During peacetime, the only military airlift capacity that may be used to provide transportation is that capacity which:

1. Is not needed to meet the transportation requirements of the military forces of the country providing the transportation, and

2. Was not created solely to accommodate the requirements of the military forces of the country receiving the transportation.

D. Transportation incident to transactions under the Arms Export Control Act (AECA) using aircraft operated by or for the military forces of the United States will be under US FMS procedures at the rate of reimbursement for FMS Defense Transportation System shipments.

IV. POINTS OF CONTACT

A. AUSTRALIA

Director General Movement & Transport
Department of Defence
CANBERRA ACT 2600

B. UNITED STATES

Deputy Assistant Secretary of the Air Force
(Logistics and Communication)
Department of the Air Force
Pentagon
Washington, D.C. 20301

ANNEX H

ASSIGNMENT/ADJUSTMENT OF FORCE/ACTIVITY DESIGNATORS (FAD)

I. PURPOSE

Further to paragraph 12 of the US/AS MOU on logistic support, principles and procedures for assigning or adjusting US FAD for specific Australian military organizational elements or tasks are outlined below.

II. DEFINITION

A FAD is defined as the numerical expression of the relative order of priority given to a specific military force, unit, function, project, task or program. For example, specified combat-ready and direct combat support forces (of comparable importance to US forces) of selected countries are assigned FAD III.

III. PRINCIPLES

Acknowledged principles governing the assignment or adjustment of foreign countries FADs are as follows:

A. FAD are authorized by the US Joint Chiefs of Staff (JCS).

B. The US Commander in Chief, Pacific Command (USCINCPAC) may recommend variation in the level of FAD authorized to the JCS.

C. On an emergency basis, USCINCPAC has the JCS-delegated authority to raise the level of FAD temporarily (not exceeding 180 days) up to and including FAD II.

D. The Defense Attache (DATT) responsible for security assistance management in Australia may recommend through USCINCPAC to JCS if Australian operational necessity requires the assignment of a higher FAD than authorized.

E. The Defense Attache (DATT) to Australia responsible for security assistance management has been delegated authority to assign and coordinate the use of FADs up to levels authorized.

F. For defense articles or services purchased as Foreign Military Sales, the US Military Service with primary interest may assign to specific sales cases a temporary FAD if a higher one is required (not to exceed 180 days and up to and including FAD II).

IV. PROCEDURES

In implementing the above principles the following procedures will be observed:

A. Routine Adjustments. For routine adjustment of FAD up to the authorized levels, application will be made by the Australian Defence Procurement Agencies to the DATT for security assistance management in Australia.

B. Emergency Temporary Assignments. For emergency assignments of temporarily higher FAD than the level authorized, the Australian Chief of Defence Force (CDF) will apply direct to USCINCPAC, informing HADS (Washington) and DCATT (Canberra).

C. Variation to the Authorized FAD Exceeding 180 Days. For variation to the authorized FAD, CDF will forward a recommendation for appropriate assignment to USCINCPAC for submission to JCS, informing HADS (Washington) and the US Ambassador (Canberra).

D. Application to FMS Purchase. Upon notification of temporary or permanent assignment of a FAD, US Military Services will take appropriate action to reflect that assignment in their records and FMS cases.

E. Notification. Variation in the level of FAD will be notified to interested authorities and agencies by:

1. For routine adjustments within the authorized FAD,

   a. Director General of Supply - Navy, Army, Air Force for Australia and
   b. DATT Canberra for the USA;

2. For emergency assignments of FAD,

   a. CDF for Australia and
   b. USCINCPAC for the USA;

3. For variation to the authorized FAD,

   a. CDF for Australia and
   b. OJCS for the USA

Appendix C: Glossary of Terms

ASEAN is the acronym for the international organization referred to as the Association of Southeast Asian Nations that includes Thailand, Indonesia, Malaysia, Brunei, The Philippines, and Singapore. ASEAN is based on political, economic, and social links and is not a defense pact. However its success as a cohesive group has added substantially to the strategic stability of the region (6:14)

Australia's regional strategic interest lies in South-East Asia, the South-West Pacific, and the East Indian Ocean regions. Political, economic and military developments in these areas are of fundamental concern to Australia (6:12).

Constructs were ideas developed for this research upon which the hypotheses were based. Constructs are more complex concepts, built from a series of simpler concepts (39:26).

Critical Technology consist of:

a. Arrays of design and manufacturing know-how (including technical data);
b. Keystone manufacturing, inspection and test equipment;
c. Keystone materials; and
d. Goods accompanied by sophisticated operation, application, or maintenance know-how that could make a significant contribution to the military potential of any country or combination of countries that may prove detrimental to the security of the U.S. (also referred to as Military Critical Technology) (17:7-21).

Cross-sectional studies are based on observations made at one time. While such research is limited by this characteristic, inferences can be made about processes that occur over time (3:111).

Coordinating Committee for Multinational Export Controls (COCOM) was established in 1949 to serve as the forum for Western efforts to develop a system of strategic export controls. Its is composed of the U.S., the United Kingdom, Turkey, Portugal, Norway, the Netherlands, Luxembourg, Japan, Italy, Greece, France, the

Federal Republic of Germany, Denmark, Canada, and Belgium (29:28). COCOM has three major functions. First, it establishes and updates the precise technical definitions of military relevant products and technologies that should be controlled. These are grouped into three lists: 1) military or munitions; 2) atomic energy; 3) dual-use or industrial/commercial. Although COCOM control lists are not publicly available, they form the basis for national controls lists administered by each member government. Corresponding U.S. lists are: 1) Munitions List, 2) Nuclear Control List, 3) Commodity Control List. Second, COCOM reviews individual members' requests to permit shipment of specific embargoed items to proscribed countries when the risk of diversion to military use is sufficiently small. Finally, COCOM member countries coordinate their export control administration and enforcement activities. COCOM is a strictly voluntary arrangement and is not legally binding on its members. COCOM decisions on what can be exported must be unanimous (16:102 and 53:7).

Dual-use Technology is technology which is primarily for commercial purposes, but which also has potential for military application (53:3).

Goods are any article, material, supplies or manufactured products, including inspection and test equipment but excluding technical data (17:7-21).

Hypotheses are statements about constructs which are formulated for empirical testing (39:30-31).

Intellectual Property (IP) is technology which covers a broad range of managerial and technical knowledge and expertise, and includes inventions, patented or not, trademarks, industrial designs, copyrights and technical information including software, data, designs technical know-how, manufacturing information and know-how, techniques, technical data packages, manufacturing data packages and trade secrets. Intellectual property rights have been defined as "the rights to use or have IP, and include rights derived from patents, trademarks, copyrights, industrial designs, contract clauses, disclosure in confidence techniques, or other means of control of IP" (17:7-17).

Interoperability is the ability of systems, units, or forces to provide service to and accept services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together. Interoperability is a subset term of rationalization (17:7-4).

Know-how is a peculiarly American term, which is receiving growing acceptance in international contracts. It is a generic term, embracing everything that is necessary to implement the licensing objective exclusive of patents and trademarks. Included may be trade secrets, manufacturing processes and techniques, specifications, charts, formulae, drawings and blueprints, marketing techniques, and professional advice. The list is non-exhaustive. Essential to the value of know-how is that it not be readily known or available to the public (17:7-8).

Logistics is the science of planning and carrying out the movement and maintenance of forces. In its most comprehensive sense, those aspects of military operations which deal with:

a. design and development, acquisition, storage, movement, distribution, maintenance, evacuation, and disposal of material;
b. movement, evacuation, and hospitalization of personnel:
c. acquisition or construction, maintenance, operation, and disposal of facilities; and
d. acquisition or furnishing of services. or; the phase of military operations involving procurement, delivery, storage, shipment, and scheduling of military supplies, including personnel (2:401).

Longitudinal Studies in research involve observations which are made many times. Such observations may be made of samples drawn from the general population (trend studies), samples drawn from more specific sub-populations (cohort studies), or the same sample of people each time (panel studies) (3:111).

Memoranda of Understanding are documents that express mutually agreed statements of fact, intentions, procedures and parameters for future action and matters of coordination. These documents may or may not be legally binding under international law but the conditions of the arrangement are politically and morally binding. The wording in such documents is usually non-mandatory (2:441).

Military technology or military related technology refers to technology solely designed for defense application and used in defense equipment, and commercial technology which is incorporated into defense system or utilized as defense equipment in its own right (dual-use technology)

Munitions are defined to include:

a. Arms, ammunition and implements of war.
b. Any property, installation, commodity, material, equipment, supply, or goods used for the purpose of making military sales.
c. Any machinery, facility, tool, material, supply or other item necessary for the manufacture, production, processing repair, servicing, storage, construction, transportation, operation or use of any article listed in this paragraph.
d. Technical data related to State Department Munitions List items (17:7-22).

Offset Arrangements involve agreements between countries that provide the procedures for the country that is making the major defense equipment purchase to balance out the trade and expenditures involved, by the selling country agreeing to make offsetting purchases from the recipient country (17:7-8).

Patents are the grant of certain monopoly rights conferred by a government on an inventor by virtue of his invention and enforceable for a certain period of time, and only within the territorial limits of the country in which it was granted. The monopoly granted to the patentee excludes others from making or using the invention by enabling the patentee to bring suit for infringement. In this sense, a patent can not prevent infringement, but it does provide for redress (17:7-8).

Rationalization is any action that increases the effectiveness of allied forces through more efficient, and effective use of defense resources committed to the alliance. Armaments collaboration is a crucial feature of rationalization. The terms standardization and interoperability are, in a sense, subsets of rationalization (17:7-4).

Security Assistance are group programs authorized by the Foreign Assistance Act of 1961, as amended, and the Arms Export Control Act of 1976, as amended, or other related statutes by which the U.S. provides defense articles, military training, and other defense related services, by grant, credit or cash sales, in furtherance of national policies and objectives (18:B-9).

Services are defined to include any service, test, inspection, repair, training, publication, technical or other assistance, or defense information used for the purpose of furnishing military assistance, but does not include military education and training activity (17:7-22).

Significant Military Equipment are defense articles and services on the U.S. Munitions List in the ITAR which are preceded by an asterisk. They are articles which require special export controls "because of their capacity for substantial utility in the conduct of military operations." (68:337)

Standardization is the process by which member nations of NATO achieve the closest practicable cooperation among forces, the most efficient use of research, development and production resources, and agree to adopt on the widest possible basis the use of:

a. Common or compatible operational, administrative, and logistics procedures;
b. Common or compatible technical procedures and criteria;
c. Common compatible or interchangeable supplies, components, weapons, or equipment; and
d. Common or compatible tactical doctrine with corresponding organizational compatibility. Standardization is a subset term of rationalization (17:7-4).

Technical Data is classified or unclassified information relating to defense articles and defense services. This involves information of any kind that can be used, or adapted for use, in the design, manufacture, repair, overhaul, processing, engineering, development, production, use, operation, maintenance, modification, or reconstruction of defense articles or defense services; or of any technology which advances the state-of-the-art of articles on the U.S. Munitions List or establishes a new art in an area of significant military applicability in the U.S. The data may take a tangible form, such as a model, prototype, blueprint, drawings, photographs, plans, instructions, computer software and manuals or operating manuals; or they may take an intangible form such as a technical service or oral or visual interactions. This does not include information concerning general scientific, mathematical or engineering principles. (17:7-22 and 68:338).

Technology is the technical information and know-how that can be used to design, produce, manufacture, utilize, or reconstruct goods, including technical data and computer software, but not the goods themselves (17:7-21).

Technology Transfer is the process of transferring, from the industry in one country to another or between countries, technical information relating to the design, engineering manufacturing and production techniques for hardware

systems using recorder or documented information of a scientific or technical nature. It does not normally include the transfer of common reference documentation such as military standards, specifications, handbooks or commercial counterparts of these documents (17:7-17).

Transfer Mechanism are the means by which technology, goods, services, and munitions are transferred. The following list is an example but not all inclusive.

a. Commercial and government sales.
b. Scientists, engineers, students, and academic exchanges.
c. Consulting agreements.
d. Licensing and other data exchange agreements.
e. Co-development and co-production agreements.
f. Commercial proposals and associated business ventures.
g. Trade fairs, exhibits, airshows, etc.
h. Sales to third party nations.
i. Multinational corporation transfers.
j. Foreign technical missions.
k. International programs (for example, fusion, space, high energy).
l. International meetings and symposia on advanced technology.
m. Patents.
n. Clandestine or illegal acquisition of military or dual-use technology or equipment.
o. Dissemination of technical reports and technical data, whether published or by oral or visual release.
p. Dissemination of technical reports through the Freedom of Information Act.
q. Diversion or evasion of control procedures.
r. Smuggling.
s. Dummy corporations.
t. Acquiring an interest in U.S. industry, business, and other organizations (17:7-23).

Treaties are agreements negotiated between nations which becomes legally binding under international law. Negotiation of a treaty is authorized by a representative of each of the states and ratified by the national executive councils of those states. Treaties can be either bilateral or multilateral agreements that principally deal with issues of government policy or matters over which no country has a sovereign right to singularly enforce its domestic laws. The intention of a treaty is often to demonstrate a relationship between two parties that is based upon a common ideal.

Appendix D: Preliminary Thesis Interviews for Questionnaire Development

LS 23 Jan 1987

Letter of Introduction

Counselor of Supply
Australian Embassy
1601 Massachusetts Avenue, NW
Washington DC 20036

1. The purpose of this letter is to introduce one of our Australian-sponsored graduate students, Mr. Warren Wood, and to solicit your assistance in providing Mr. Wood with information he needs to carry out his research project.

2. Mr. Wood is one of six Australian military officers and government employees who have been assigned to the Air Force Institute of Technology to obtain their Master of Science degrees in Logistics Management. One of our requirements for the degree is completion of a master's thesis and Mr. Wood, with the cooperation of his Australian sponsors, has elected to study "The Effects of U.S. Government Policy on the Transfer of Military Technology to Australia." To accomplish his research, Mr. Wood needs to speak with a variety of key personnel in the Australian Embassy and selected U.S. government offices.

3. Mr. Wood will be contacting you shortly. Any assistance you can provide to Mr. Wood in identifying contacts and facilitating interviews to accomplish his research would be greatly appreciated. I have also enclosed several attachments which may be of interest to you.

4. If you need any additional information concerning Mr. Wood or his project, please do not hesitate to contact me or his thesis advisor, Lt Col Robert D. Materna (513-255-5023), at any time.

signed

WILLIAM A. MAUER
Acting Dean
School of Systems & Logistics

3 Atch
1. Thesis Proposal
2. Biography
3. Security Advice, XP-90

PRELIMINARY THESIS INTERVIEWS FOR QUESTIONNAIRE DEVELOPMENT:
Washington DC, 23-25 February 1987

Questions for Personal Interviews

Respondent Particulars

Name: _____

Position: _____

Organization: _____

Location: _____

Date/Time: _____

Place: _____

Questions

1. In your view why does Australia purchase a majority of its defense equipment from the U.S.?

2. From your knowledge and experience what do you believe are the reasons for Australia seeking requests for the transfer of military or dual-use technology from the U.S.?

3. How would you describe Australia's defense relationship with the U.S. and why?

4. Broadly speaking, what are some of the most productive areas of current military/political cooperation between Australia and the U.S.?

5. More specifically, what do you feel are the most important aspects of defense cooperation between Australia and the U.S.?

6. With respect to the transfer of military technology how would you compare the relationship between Australia and U.S. and that of the U.S. and other nation or international organizations?

7. Do you believe there is any justification for Australia to be treated any differently to any other country when requesting the transfer of military technology from the U.S. Why?

8. Specifically, what Arms Transfer policy criteria are used by the U.S. to approve Australian applications for the transfer of military technology?

* Regional stability and conflict: The stabilizing influence of Australia in SE Asia and the Pacific is important. The presence of a professionally, well equipped ADF is a deterrent to aggression in the area in conjunction with the US Aust alliance.

* U.S. force readiness: The US/Aust defense relationship provides a stepping stone for some US contingencies thru the provision of logistic support etc., thereby improving US force readiness. Aust is reasonably self-reliant and request for military assistance is not likely to have detrimental effects on US force readiness.

* Impending military threat: Aust has no perceived threat for the next 10-15 years. This may weigh against Aust request for Arms but should be viewed in the light of point one.

* Human rights violations: None

* Effective utilization by a recipient country: Aust has a responsible government and military weapons are used for the purpose of defense of Aust.

* Economic capacity and capabilities of the recipient country: Aust has the capacity to pay for weapons up front.

9. Against which of the above criteria do U.S. officials have the greatest latitude when considering a request from Australia for the transfer of military technology?

10. Which principal administrative international agreements are used to outline the policy and manage the process of the transfer of military technology between Australia and the U.S.?

11. Which types of equipment and intellectual property requested by Australia for technology transfer cause the most concern to the U.S.; either dual-use or military? Why?

12. From your knowledge and experience, does Australia provide sufficient security measures, such as regulatory policies and administrative mechanisms to safeguard dual-use or military technology obtained from the U.S.?

13. To what extent do you believe that Australian agencies understand the U.S. policies concerning technology transfer of military or dual-use technology?

14. Which agencies or government departments in Australia/ U.S. are responsible for establishing and reinforcing technology transfer policy from the U.S. to Australia?

15. In your view what aspects of U.S. policy cause problems for Australia when seeking the transfer of military or dual-use technology from the U.S.?

16. With respect to U.S. requirements or criteria, how can the applications for the transfer of technology transfer by Australia be improved so their passage through the U.S. decision process is more successful?

17. Which organizational elements within the U.S. DoD are concerned with technology transfer policy for both military and dual-use technology. (Informational question)?

18. Which elements of the State Department are concerned with technology transfer policy for both military and dual-use technology. (Informational question)?

19. Which elements of the Department of Commerce are concerned with technology transfer policy for both military and dual-use technology. (Informational question)?

20. What is the U.S. approval decision cycle through which each request for military or dual-use technology transfer must go. (Informational question)?

Appendix E: 1987 Technology Transfer Survey Instrument

DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY
AIR FORCE INSTITUTE OF TECHNOLOGY
WRIGHT-PATTERSON AIR FORCE BASE OH 45433-6583

REPLY TO ATTN OF: LSG (Warren Wood)

SUBJECT: Thesis Questionnaire on Technology Transfer

TO:

1. Technology transfer has always been a subject of considerable interest to both the U.S. and Australian Governments. Mr. Warren Wood is conducting research into "the effects of U.S. Government policy on the transfer of technology to Australia." The outcome of the research will be published as a thesis in partial fulfillment of the requirements for a master's degree from the U.S. Air Force Institute of Technology (AFIT), Wright-Patterson Air Force Base. Mr. Wood is a member of the Australian Department of Defense and a student in the AFIT master's program.

2. We have chosen your functional position as one from which a representative response is sought on the subject. Only a small number of functional positions are included in the statistical population. Therefore, in order that the results will be representative of the attitudes and thinking on this subject, we request you complete the attached questionnaire. We will provide complete confidentiality to all responses.

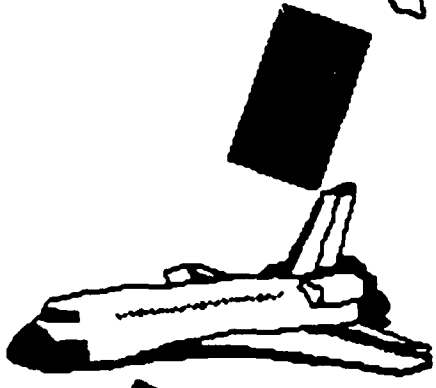
3. Please complete the attached questionnaire within 10 working days of receipt and enclose your response in the return addressed envelope. Please direct any inquiries to either Mr. Warren Wood at 513-255-4437 or Lt Colonel Bob Materna at 513-255-5023.

PHILLIP R. LIDDICOAT
Counsellor Supply
Embassy of Australia

LARRY L. SMITH, Colonel, USAF
Dean
School of Systems and Logistics

13 May 1987

STRENGTH THROUGH KNOWLEDGE



A STUDY OF THE TRANSFER OF TECHNOLOGY FROM THE U.S. TO AUSTRALIA

1987 TECHNOLOGY TRANSFER SURVEY

INSTRUCTIONS

1. Please do **NOT** put your name on the questionnaire. Each questionnaire will become part of a database to analyze the effects of U.S. Government policy on the transfer of military technology to Australia.

2. Complete **ANONYMITY** shall be afforded each individual's response to the survey.

3. Please read the attached questionnaire carefully, and **answer all the questions to the best of your knowledge.**

4. Please complete Parts I, II, and III of the survey, and mark all your answers on the questionnaire.

5. After the U.S. participants complete the questionnaire, enclose it in the attached self addressed stamped envelope, and return it through the U.S. postal system. For the Australian participants enclose your responses in the return addressed envelope, and send it to the Director International Logistic Policy who shall forward it to the U.S.

6. Please return the completed survey within **ten working days** of receipt.

7. If you would like a copy of the results please send your request to AFIT/LSG ATTN Lt Col R. Materna, Wright-Patterson Air Force Base, OH 45433 or phone 513-255-5023.

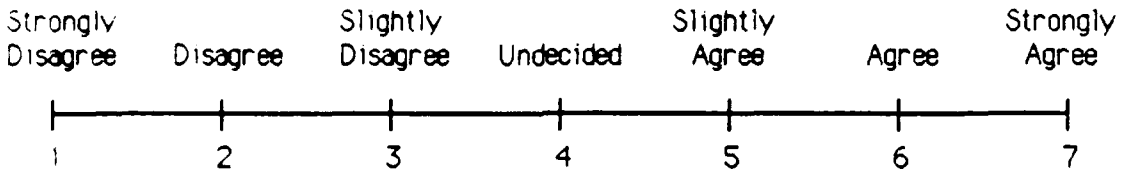
8. Thank you for your participation in this thesis research effort.

1987 TECHNOLOGY TRANSFER SURVEY

PART I

U.S. AND AUSTRALIAN ATTITUDES CONCERNING THE TRANSFER OF TECHNOLOGY FROM THE U.S. TO AUSTRALIA

Using the scale below circle the number corresponding to the extent with which you agree/disagree with each statement.



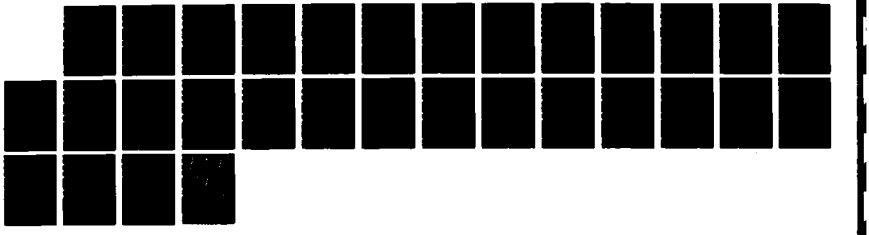
Questions 1 through 11 deal with the defense relationship between Australia and the U.S., and Australia's equipment acquisition strategy.

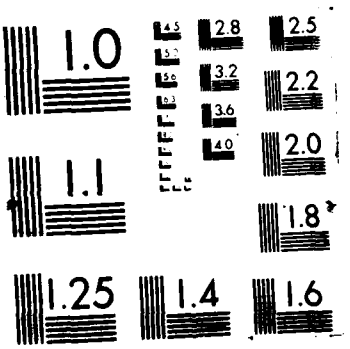
1. Joint U.S./Australia defense facilities in Australia are critical to U.S. strategic interests. 1 2 3 4 5 6 7

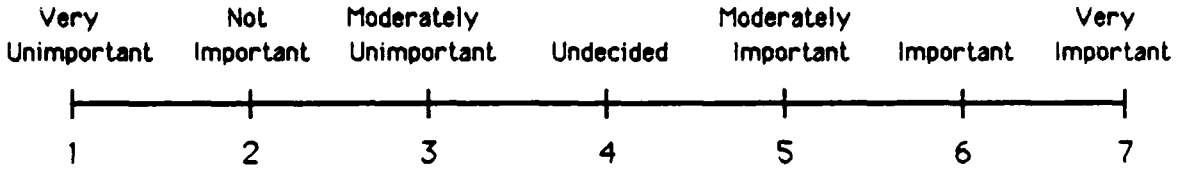
2. The U.S. Security Assistance Program has played a key role in assisting the Australian Defense Force to become more self-reliant. 1 2 3 4 5 6 7

3. The defense relationship between Australia and the U.S. is vital to important in promoting U.S. strategic interests in the Southeast Asian and Pacific Regions.

AD-A186 473 THE EFFECTS OF UNITED STATES GOVERNMENT POLICY ON THE 3/3
TRANSFER OF MILITAR (U) AIR FORCE INST OF TECH
WRIGHT-PATTERSON AFB OH SCHOOL OF SYST W N WOOD
UNCLASSIFIED SEP 87 AFIT/GLM/LSM/87S-85 F/G 5/4 NL

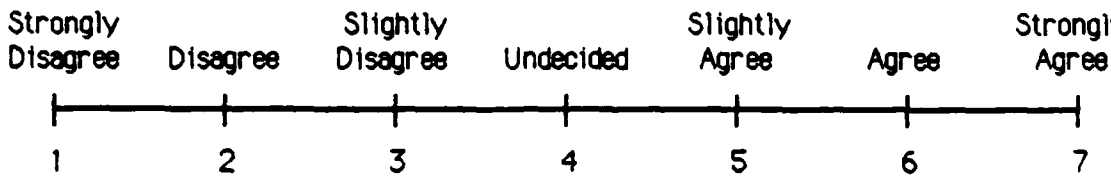



1.0
1.1
1.25
1.4
1.6
2.8
3.2
3.6
4.0
2.5
2.2
2.0
1.8



4. Using the scale above please rate the importance of each of the following areas of defense cooperation between Australia and the U.S.

a. Joint U.S./Australian defense facilities in Australia. For example the satellite ground stations at Nurrungar and Pine Gap.	1	2	3	4	5	6	7
b. Logistics cooperation or reciprocal logistics support.	1	2	3	4	5	6	7
c. Regional stability through the U.S. Security Assistance Program.	1	2	3	4	5	6	7
d. Joint exercises and training.	1	2	3	4	5	6	7
e. Defense intelligence exchanges.	1	2	3	4	5	6	7
f. Joint Research and Development.	1	2	3	4	5	6	7
g. Increasing the interoperability of the Australian and U.S. armed forces.	1	2	3	4	5	6	7
h. Exchange of views on military doctrine.	1	2	3	4	5	6	7
i. Exchanges of defense scientific information.	1	2	3	4	5	6	7
j. Common strategic interests fostered through the ANZUS alliance.	1	2	3	4	5	6	7
k. The development of a more self-reliant Australian Defence Force by the acquisition of U.S. equipment and technology.	1	2	3	4	5	6	7
l. Others- please state below.							
.....	1	2	3	4	5	6	7
.....	1	2	3	4	5	6	7



Using the scale above circle the number corresponding to the extent with which you agree/disagree with the following statements.

5. Australia purchases the majority of its defense equipment from the U.S. **because of the strong defense relationship** which exists between both nations through the ANZUS Treaty. 1 2 3 4 5 6 7

6. Australia purchases the majority of its defense equipment from the U.S. **because the U.S. defense industry has the capability to design, develop, and manufacture major weapons systems which are at the forefront of technology.** 1 2 3 4 5 6 7

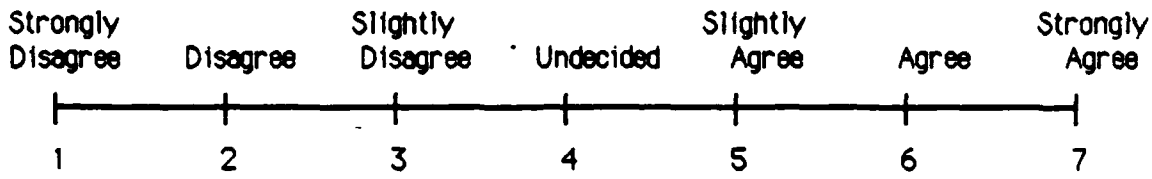
7. Australia's preference to acquire defense equipment of U.S. origin is heavily influenced by **similar military strategic objectives** which are shared by both countries. For example collective security, and deterrence. 1 2 3 4 5 6 7

8. Australia's preference to acquire defense equipment of U.S. origin is heavily influenced by **similar socio-economic ideals** that are shared by both countries. 1 2 3 4 5 6 7

9. **Interoperability** with U.S. forces is **not** a major consideration when Australia is seeking to acquire a new weapons system. 1 2 3 4 5 6 7

10. U.S. Foreign Military Sales offer the Australian Department of Defence a **timely means of obtaining logistic support throughout the life of the system.** 1 2 3 4 5 6 7

11. The acquisition of defense equipment through U.S. Foreign Military Sales gives Australia the **opportunity to procure equipment more economically** by becoming part of a U.S. defense procurement contract. 1 2 3 4 5 6 7



Using the scale above circle the number corresponding to the extent with which you agree/disagree with the following statements.

This section of the questionnaire deals with aspects of technology transfer policies and procedures.

12. U.S. Department of Defense policy on the transfer of military technology **requires complete justification on a case-by-case basis.** 1 2 3 4 5 6 7

13. Australian commercial and government agencies have demonstrated **the ability to safeguard sensitive U.S. technology** in accordance with the U.S. National Disclosure Policy through adherence to the General Defense Security Information Agreement. 1 2 3 4 5 6 7

14. When Australia procures a major weapon system **through U.S. Foreign Military Sales**, no further application should be necessary for the transfer of technology relating to sub-systems or major components of the system. 1 2 3 4 5 6 7

15. When Australia procures a major weapon system **through a U.S. government approved direct commercial sale**, no further application should be necessary for the transfer of technology relating to sub-systems or major components of the system. 1 2 3 4 5 6 7

16. When procuring defense equipment from the U.S., Australia's status under the ANZUS Treaty should facilitate the transfer of **all** the technology required by Australia to independently maintain and support that equipment throughout its life cycle. 1 2 3 4 5 6 7

17. When Australia applies for the transfer of technology of items on the U.S. Military Critical Technology List, the application is critically reviewed from an **economic** standpoint as well as from a national security perspective. 1 2 3 4 5 6 7

Very Unimportant	Not Important	Moderately Unimportant	Undecided	Moderately Important	Important	Very Important
1	2	3	4	5	6	7

18. Using the scale above please rate the importance of each of the following reasons why **Australia** requests the transfer of military technology **from the U.S.**

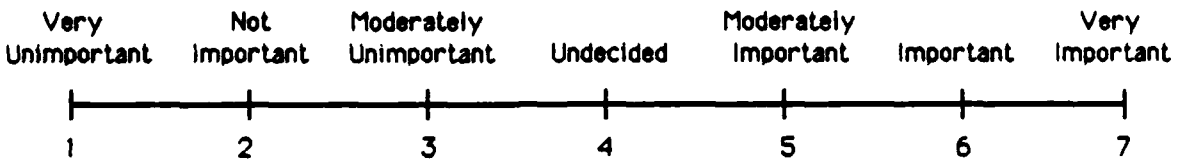
a. To gain access to the latest U.S. industrial processes and manufacturing techniques.	1	2	3	4	5	6	7
b. To improve the self-reliant nature of the Australian Defence Force.	1	2	3	4	5	6	7
c. To assist making the Australian Defence Force generally interoperable with U.S. forces.	1	2	3	4	5	6	7
d. To acquire the most advanced military technology in the world.	1	2	3	4	5	6	7
e. Develop internationally competitive industry in Australia.	1	2	3	4	5	6	7

19. Using the scale above please rate the importance of each of the following **U.S. government departments** with respect to its role in developing and implementing U.S. policy on the transfer of military technology.

a. Department of Commerce.	1	2	3	4	5	6	7
b. Department of State.	1	2	3	4	5	6	7
c. United States Customs Service.	1	2	3	4	5	6	7
d. Department of Defense.	1	2	3	4	5	6	7

20. Using the scale above please rate the importance of each of the following **Australian** government departments with respect to its responsibility for monitoring and responding to U.S. policy on the transfer of military technology to Australia.

a. Department of Prime Minister and Cabinet.	1	2	3	4	5	6	7
b. Department of Foreign Affairs.	1	2	3	4	5	6	7
c. Australian Customs Service.	1	2	3	4	5	6	7
d. Department of Defence.	1	2	3	4	5	6	7
e. Department of Trade.	1	2	3	4	5	6	7

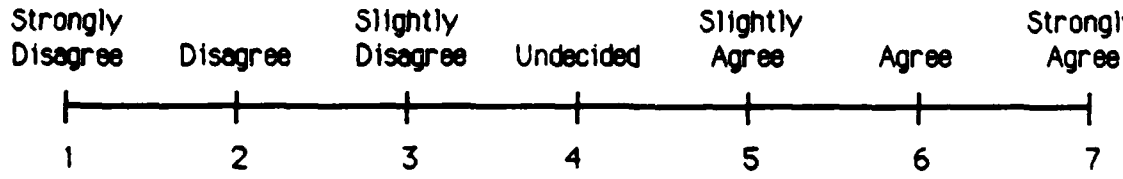


21. Using the scale above please rate the importance of the role of each of the following roles that these **U.S. agencies** in issues concerning the transfer of military technology to Australia.

a. Defense Technology Security Administration.	1	2	3	4	5	6	7
b. Defense Security Assistance Agency.	1	2	3	4	5	6	7
c. The Office of the Assistant Secretary (DoD), International Security Affairs.	1	2	3	4	5	6	7
d. The Office of the Assistant Secretary (DoD), International Security Policy.	1	2	3	4	5	6	7
e. The Military Departments of the Army, Navy or Air Force.	1	2	3	4	5	6	7
f. The U.S. Intelligence Community.	1	2	3	4	5	6	7
g. Office of Export Administration in the Department of Commerce.	1	2	3	4	5	6	7
h. Office of Munitions Control, Department of State.	1	2	3	4	5	6	7
i. Arms Control Disarmament Agency.	1	2	3	4	5	6	7

22. Using the scale above please rate the importance of each of the following **principal documents** which contain U.S. government policy and procedures for the transfer of technology.

a. The National Disclosure Policy.	1	2	3	4	5	6	7
b. The Arms Export Control Act of 1976, as amended.	1	2	3	4	5	6	7
c. The International Traffic in Arms Regulation (ITAR)	1	2	3	4	5	6	7
d. The DoD Directive 2040.2 on the International Transfer of Technology, Goods, Services and Munitions.	1	2	3	4	5	6	7
e. The Export Administration Act of 1979, as amended.	1	2	3	4	5	6	7



Using the scale above circle the number corresponding to the extent with which you agree/disagree with the following statements.

23. The Memorandum of Understanding on Logistic Support between Australia and the U.S. does **not** adequately encapsulate the policies and procedures that provide for the transfer of military technology to Australia from the U.S. 1 2 3 4 5 6 7

24. Policy documents which define the guidelines to facilitate the transfer of military technology between Australia and the U.S. are **less important** than the actual contractual agreements which relate to specific purchases of defense equipment and technology. 1 2 3 4 5 6 7

25. Australian requests for the transfer of military technology, receivethe **same status** as applications from senior NATO partners. 1 2 3 4 5 6 7

Please respond to this question by circling either Yes or No, and briefly explain your response in the space provided below.

26. Should there be a government-to-government agreement dedicated to the transfer of technology between Australia and the U.S. which would establish precise detailed policies and procedures on this subject? Yes No

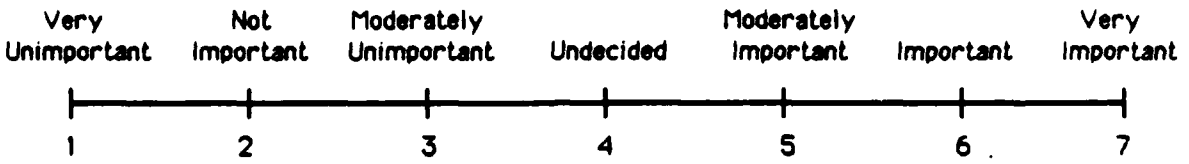
.....

.....

.....

.....

.....



The final question relates to potential problems with technology transfer.

27. Using the scale above please rate the importance of each of the following potential problems which might be experienced by Australia when requesting the transfer of military technology from the U.S.

a. The **vast number** of U.S. Policies, Directives, Regulations, **and** Acts leads to **overly strict controls** on items which are readily available commercially or from other countries. 1 2 3 4 5 6 7

b. The size and complexity of the U.S. bureaucracy involved in the technology transfer process causes problems in **identifying the initial point of contact** for a request for the transfer of technology. 1 2 3 4 5 6 7

c. The **potential extraterritorial application of U.S. export laws** if an Australian firm transfers U.S. technology to a third party without approval from the U.S. 1 2 3 4 5 6 7

d. U.S. **reluctance to allow the transfer of certain types of information** to Australia, such as source codes for sophisticated computerized equipment, reduces the ability of the Australian Defence Force to become self-reliant. 1 2 3 4 5 6 7

e. Others- please state below.

..... 1 2 3 4 5 6 7

..... 1 2 3 4 5 6 7

PART II

DEMOGRAPHIC INFORMATION

Please circle your response to the following questions.

28. My age group is:
    a. 20-25 years.
    b. 26-30 years.
    c. 31-35 years.
    d. 36-40 years.
    e. 41-45 years.
    f. 46-50 years.
    g. Over 50 years.

29. My rank or grade is:

U.S. Respondents
    a. GS-11
    b. GS-12
    c. GS/GM-13
    d. GS/GM-14
    e. GS/GM-15
    f. GS/GM 16-18
    g. SES
    h. 2nd LT
    i. 1st LT
    j. CAPT
    k. MAJ
    l. LTCOL
    m. COL
    n. General Officer

Australian Respondents
    aa. Class 5
    bb. Class 6
    cc. Class 7
    dd. Class 8
    ee. Class 9
    ff. Class 10
    gg. Class 11
    hh. SES
    ii. 2nd LT: PLT OFF
    jj. 1st LT: FLG OFF: SBLT
    kk. CAPT: FLT LT: LEUT
    ll. MAJ: SQN LDR: LCDR
    mm. LTCOL or WG CDR or CMDR
    nn. COL or GP CAPT or CAPT
    oo. General Officer: Air Officer: Flag Officer

30. I have held my current functional (job) position for :
    a. Less than 1 year.
    b. 1 year but less than 2.
    c. 2 years but less than 3.
    d. 3 years but less than 4.
    e. 4 years but less than 5.
    d. 5 years or more.

31. My current position is with:
    a. An agency within the U.S. Department of Defense (DoD).
    b. A non-DoD U.S. agency.
    c. An organization within the Australian Department of Defence.
    d. Not the Australian Department of Defence.

PART III

COMMENTS

Please make any other comments you may have regarding the transfer of military technology to Australia which were not covered in this survey.

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Appendix F: Organizations Sampled

United States Organizations Sampled

Deputy Director, (1)*
Office of Munitions Control
Room 800, SA-6,
Department of State
Washington D. C. 20520

Chief, Arms Licensing
Division (1)
Office of Munitions Control
Room 800, SA-6,
Department of State
Washington D. C. 20520

Deputy Chief,
Arms Licensing Division (1)
Office of Munitions Control
Room 800, SA-6,
Department of State
Washington D. C. 20520

Licensing Officer,
Arms Licensing Division, (1)
Office of Munitions Control
Room 800, SA-6,
Department of State
Washington D. C. 20520

Licensing Officer,
Arms Licensing Division, (1)
Office of Munitions Control,
Room 800, SA-6,
Department of State
Washington D. C. 20520

Director Strategic Technology
Affairs, (3)
Room 7430,
Department of State,
Washington D. C. 20520

*The number in parentheses denotes the number of surveys sent to that organization.

Director Office of Technology &
Policy Analysis, (2)
Department of Commerce,
Washington D. C. 20520

Director, (2)
Office of Export Licensing,
Department of Commerce,
Washington D. C. 20520

Director, Office of Foreign
Availability, (2)
Department of Commerce,
Washington D. C. 20520

Director,(1)
Technology Transfer Policy &
Control Division OP-62,
Navy Department,
Washington D. C. 20350-2000

Director, (1)
Technology Transfer Policy
Branch,
Navy Department,
Washington D. C. 20350-2000

Director, (1)
Technology Transfer Control
Branch,
Navy Department,
Washington D. C. 20350-2000

Director, (1)
Foreign Disclosure Branch
Navy Department
Washington D. C. 20350-2000

Attn: DALO-SAC (3)
Dept of Army
Pentagon
Washington D. C. 20310-0513

Office of the Secretary of
Defense, International Security
Affairs, East Asia Pacific
Region, (1)
Assistant for Australia/New
Zealand and Pacific Affairs,
Room 4C840, Pentagon,
Washington D. C.

Director, (2)
Foreign Disclosure Policy
HQ USAF-CVAIP,
Pentagon,
Washington D. C. 20330

Director, (1)
Disclosure Branch,
HQ USAF-CVAIP,
Pentagon,
Washington D. C. 20330

Director, (1)
Weapons Systems Division,
Defense Security Assistance
Department of Defense,
Room 4B740,
Pentagon,
Washington D. C. 20310-0513

Director, (1)
Operations Division,
Defense Security Assistance
Department of Defense,
Room 4B740,
Pentagon,
Washington D. C. 20310-0513

Deputy Director, (1)
Defense Security Assistance
Department of Defense,
Room 4E841,
Pentagon,
Washington DC 20310-0513.

Director Munitions, (3)
Defense Technology Security
Administration,
Room 4D825
Pentagon,
Washington DC 20301-2700.

Director Strategic Trade,
Defense Technology Security
Administration, (3)
Room 4D825
Pentagon,
Washington DC 20301-2700.

Director Munitions Technical,
Defense Technology Security
Administration, (3)
Room 4D825
Pentagon,
Washington DC 20301-2700

Director (1)
Technology Cooperation &
Defense Technology Security
Administration,
Room 4D825,
Pentagon,
Washington DC 20301-2700.

Director (1)
Technology Security Operations,
Defense Technology Security
Administration,
Room 4D825,
Pentagon,
Washington DC 20301-2700.

Political Military Advisor, (1)
Arms Transfer Division,
Room 4734,
Arms Control Disarmament
320 21st Street,
Washington DC 20451.

Assistant Deputy Under
Secretary for Defense,
International Programs &
Technology, for Asia and
Southern Hemisphere
(IPT-ASH) (3)
Room 3D173,
Pentagon,
Washington DC 20301.

OASD/International Security
Director International Economic
and Energy Affairs, (1)
Room 4B938,
Pentagon,
Washington DC 20301.

Australian Organizations Sampled

Director, International Logistic Policy (1)
Defence Logistics Organisation,
Department of Defence,
Campbell Park Offices
(CP4-2-30),
Queen Victoria Terrace,
Canberra ACT 2600,

Assistant Secretary (2)
Economic Relations Branch
Department of Foreign Affairs
Parkes ACT 2600, Australia.

Director (1)
Treaties Section, LC Division
Department of Foreign Affairs
Parkes ACT 2600, Australia.

SEO Treaties Section, (1)
Department of Foreign Affairs
Parkes ACT 2600, Australia.

Director Defence Plans
& Policy, ISPP Branch, (2)
Department of Foreign Affairs
Parkes ACT 2600, Australia.

Director Defence Projects
ISPP Branch (2)
Department of Foreign Affairs
Parkes ACT 2600, Australia.

Director America's Section,
Bilateral Trade Group, (2)
Department of Trade,
Canberra ACT 2600, Australia

Assistant Secretary Logistic
Resource Development Branch,
Defence Logistics Organisation,
Department of Defence, (1)
Campbell Park Offices
(CP4-2-35),
Queen Victoria Terrace,
Canberra ACT 2600, Australia.

Assistant Secretary Industry
Policy & Planning Branch
Defence Industry Materiel
Policy Division, (1)
Department of Defence
Russell Offices (F-1-35)
Canberra ACT 2600, Australia.

Director Industry Studies and
Analysis Section, (1)
Defence Industry Materiel
Policy Division,
Department of Defence,
Russell Offices (F-1-33),
Canberra ACT 2600, Australia.

Director Industry Policy
Section A, Defence Industry
Materiel Policy Division, (1)
Department of Defence,
Russell Offices (F-1-34),
Canberra ACT 2600, Australia.

Assistant Secretary Project
Planning & Evaluation Branch,
Defence Industry Materiel
Policy Division, (1)
Department of Defence,
Russell Offices (F-1-56),
Canberra ACT 2600, Australia.

Director (1)
Airborne Equipment Section,
Defence Industry Materiel
Policy Division,
Department of Defence,
Russell Offices (F-1-49),
Canberra ACT 2600, Australia.

Director Ground Force
Defence Industry Materiel
Policy Division, (1)
Department of Defence,
Russell Offices (F-1-51),
Canberra ACT 2600, Australia.

Director Technology Transfer
and Analysis Section, (1)
Defence Industry Materiel
Policy Division,
Department of Defence,
Russell Offices (F-1-46),
Canberra ACT 2600, Australia.

Assistant Secretary (1)
Materiel Policy Branch,
Defence Industry Materiel
Policy Division,
Department of Defence,
Russell Offices (F-1-37),
Canberra ACT 2600, Australia.

Director Materiel Policy and
Management Section, (1)
Defence Industry Materiel
Policy Division,
Department of Defence,
Russell Offices (F-1-44),
Canberra ACT 2600, Australia.

Director Procurement Policy and
Planning Section, (1)
Defence Industry Materiel
Policy Division,
Department of Defence,
Russell Offices (F-1-41),
Canberra ACT 2600, Australia.

Director Management & Review
Implementation Section, (1)
Defence Industry Materiel
Policy Division,
Department of Defence,
Russell Offices (E-G-03),
Canberra ACT 2600, Australia.

Assistant Secretary (1)
International Policy (AUN),
Strategic International Policy
Division,
Department of Defence,
Russell Offices (F-1-08A),
Canberra ACT 2600, Australia.

CEO International Policy (JF),
Strategic International Policy
Division, (1)
Department of Defence,
Russell Offices (F-1-05),
Canberra ACT 2600, Australia.

CEO International Policy
(ANZUS)
Strategic International Policy
Division, (1)
Department of Defence,
Russell Offices (F-1-03),
Canberra ACT 2600, Australia.

SEO International Policy
Strategic International Policy
Division, (1)
Department of Defence,
Russell Offices (F-1-02),
Canberra ACT 2600, Australia.

Assistant Secretary (1)
Industry Operations Branch,
Defence Industry Development
Division,
Department of Defence,
Anzac Park West (APW2-214),
Canberra ACT 2600, Australia.

Director Export Facilitation
Section, (1)
Defence Industry Development
Division,
Department of Defence,
Anzac Park West (APW2-204),
Canberra ACT 2600, Australia.

Director Commercial Operations
Section, (1)
Defence Industry Development
Division,
Department of Defence,
Anzac Park West (APW2-213),
Canberra ACT 2600, Australia.

Director Industry Involvement
and Offsets Section, (1)
Defence Industry Development
Division,
Department of Defence,
Anzac Park West (APW1-207),
Canberra ACT 2600, Australia.

Joint Logistics Section
(JLS-1), HQ Australian Defence
Force, (1)
Department of Defence,
Russell Offices (F-3-52),
Canberra ACT 2600, Australia.

Joint Logistics Section
(JLS-2), HQ Australian Defence
Force, (1)
Department of Defence,
Russell Offices (F-3-46),
Canberra ACT 2600, Australia.

Superintendent External
Relations,
Defence Science & Technology
(1) Organisation,
Department of Defence,
Campbell Park (CP3-3-35),
Queen Victoria Terrace,
Canberra ACT 2600, Australia.

Director International
Defence Science & Technology
Organisation, (1)
Department of Defence,
Campbell Park (CP3-4-31),
Queen Victoria Terrace,
Canberra ACT 2600, Australia.

Director Aeronautical Research
Laboratories (1)
P.O. Box 4331
Melbourne, Vic 3001,

Director Materials Research
Laboratories (1)
P.O. Box 50,
Ascot Vale, Vic 3032,

Director Naval Integrated
Logistics Support Management,
Naval Materiel Division,(1)
Department of Defence,
Campbell Park Offices
(CP2-2-22),
Queen Victoria Terrace,
Canberra ACT 2600, Australia.

Director (1)
New Surface Combatant Project,
Naval Materiel Division,
Department of Defence,
Russell Offices (A-3-07)
Canberra ACT 2600, Australia.

Director (1)
Australian Frigate Project,
Naval Materiel Division,
Department of Defence,
Campbell Park Offices
(CP2-1-28),
Queen Victoria Terrace,
Canberra ACT 2600, Australia.

Director RAN Guided Missile
Frigate Project, (1)
Naval Materiel Division,
Department of Defence,
Campbell Park Offices
(CP2-2-14),
Queen Victoria Terrace,
Canberra ACT 2600, Australia.

Director New Submarine
Construction Project, (1)
Naval Materiel Division,
Department of Defence,
21 Albany St,
Fyshwick ACT 2609, Australia.

Project Director, (1)
Harpoon/Surface & Air Weapon
Naval Materiel Division,
Department of Defence,
Campbell Park Offices
(CP2-5-07),
Queen Victoria Terrace,
Canberra ACT 2600, Australia.

Director Maintenance Policy,
Air Force Technical Services
Division, (6)
Department of Defence,
Russell Offices (C-1-11),
Canberra ACT 2600, Australia.

Director Project Management &
Acquisition, (1)
Air Force Materiel Division,
Department of Defence,
Russell Offices (E-4-12),
Canberra ACT 2600, Australia.

Project Management (1)
& Acquisiton (PMA1),
Air Force Materiel Division,
Department of Defence,
Russell Offices (E-4-14),
Canberra ACT 2600, Australia.

Director of Maritime Aircraft
Projects, (1)
Air Force Materiel Division,
Department of Defence,
Russell Offices (E-4-24),
Canberra ACT 2600, Australia.

Maritime Aircraft Project
(MAPM1), Air Force Materiel
Division, (1)
Department of Defence,
Russell Offices (E-4-26),
Canberra ACT 2600, Australia.

Director Training Aircraft and
Radar Projects, (1)
Air Force Materiel Division,
Department of Defence,
Russell Offices (E-4-09),
Canberra ACT 2600, Australia.

Director (1)
Tactical Fighter Project
Office, Air Force Materiel
Division,
Department of Defence,
Russell Offices (C-4-06),
Canberra ACT 2600, Australia.

Director Utility Helicopter
Project, (1)
Air Force Materiel Division,
Department of Defence,
Russell Offices (C-3-34),
Canberra ACT 2600, Australia.

Counsellor Supply, (1)
Embassy of Australia,
1601 Massachusetts Av. N.W.
Washington DC 20036

Defence Industry Attache (1)
Embassy of Australia,
1601 Massachusetts Av. N.W.
Washington DC 20036

Air Attache (1)
Embassy of Australia,
1601 Massachusetts Av. N.W.
Washington DC 20036

Military Attache (1)
Embassy of Australia,
1601 Massachusetts Av. N.W.
Washington DC 20036

Naval Attache (1)
Embassy of Australia,
1601 Massachusetts Av. N.W.
Washington DC 20036

Appendix G: SPSSx Command and Data Files

Command File

```
title           'spssx analysis of raw survey data'

file handle     result/name='result'

data list       file=result fixed records=1/
                cty, id, q1, q2, q3, q4a, q4b, q4c, q4d, q4e,
                q4f,q4g, q4h, q4i, q4j, q4k, q4l, q4m, q5 to
                q17, q18a, q18b, q18c, q18d, q18e,q19a,q19b,
                q19c, q19d, q20a,q20b, q20c, q20d, q21a, q21b,
                q21c,q21d,q21e, q21f,q21g, q21h, q21i, q22a,
                q22b, q22c,q22d,q22e, q23 to q26,q27a,q27b,
                q27c,q27d,q27e,q27f,q28 to q31
                (f1.0,f2.0,67f1.0,f2.0,2f1.0)

missing values  q1 to q28 q30 q31 (9)

missing values  q29 (99)

value labels    q1 to q3, q5 to q17, q23 to q25
                   1 'Strongly Disagree'
                   2 'Disagree'
                   3 'Slightly Disagree'
                   4 'Undecided'
                   5 'Slightly Agree'
                   6 'Agree'
                   7 'Strongly Agree'/
                 q4a to q4m, q18a to q22e, q27a to q27f
                   1 'Very Unimportant'
                   2 'Not Important'
                   3 'Moderately Unimportant'
                   4 'Undecided'
                   5 'Moderately Important'
                   6 'Important'
                   7 'Very Important'/
                 q26
                   1 'Yes'
                   2 'No'

temporary
select if       (cty eq 1)
frequencies     variables=q1 to q31/
                histogram/statistics/
```

```
temporary
select if       (cty eq 2)
frequencies     variable=q1 to q31/
                histogram/statistics/

pearson corr    q1 to q25, q27a to q27f
option 1, 3, 6

recode          q9
                (1=7)(2=6)(3=5)(5=3)(6=2)(7=1)

reliability     variables=q1 to q27f/
                scale(constr1)=q1 to q4k/
                scale(constr2)=q5 to q11/
                scale(constr3)=q12 to q17/
                scale(constr4)=q18a to q18e/
                scale(constr5)=q19a to q21i/
                scale(constr6)=q22a to q24, q26/
                scale(constr8)=q27a to q27d/
option 1
statistics 9

discriminant    groups=cty(1,2)/
                variables=q1 to q27d/
option 1
statistics 10 12 13 14 15

title           'analysis of composite variables for
                constructs'

compute         constr1=sum(q1 to q4m)
compute         constr2=sum(q5 to q11)
compute         constr3=sum(q13 to q17)
compute         constr4=sum(q18a, q18d, q18e)
compute         constr5=sum(q19a to q21i)
compute         constr6=sum(q22a to q23)
compute         constr7=sum(q25)
compute         constr8=sum(q27a, q27b, q27d)

temporary
select if       (cty eq 1)
frequencies     variables=constr1 to constr8/
                statistics/

temporary
select if       (cty eq 2)
frequencies     variables=constr1 to constr8/
                statistics/

t-test          groups=cty(1,2)/variables=constr1 to constr8

finish
```

Data File

```
10174777666245454994644444771111666664527444477447443276664476244459950462
10269564967476554995713566661145664752317641766557423277779636233349940331
10355565336555665993553654566663665566667676666555556546665466266659970712
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10676675757266572995753177741117776775737753777627637277575677266679920111
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10877776766566667699776537737222257653333744446652733527775566725227997074 1
10966666777666576995765477376564563564726744656666544464464447226469961321
11066676655465466995654465445354765662727474777777427577774456165749970552
11176776577665666995664666273352663663617444473566535566656445251559951252
11264674547553466994455345645555445445647444465564356335556456137359921012
11365666565566675994666464555553665663626444476626526566666227152459951221
11465765567656675996659369362236325625637444463355377557767465253629940332
11566776767666666993642266266621264636626555676516514176656226224729951351
11676777777777777996656446664442455642526444466556425247762446135549940551
11776777777777777799666624576216666666236766667777423554666622692543961331
11871777555253351996655357167775695635737653766555357557765635256519930322
11965665576675567993652366761127662633657444677517427273344476235537960421
12077777776566575997755264761114766776767444766757444144444664946749999991
12173747477576575994535115471174777766737463746776776447774317155549941341
12279777777777777997777267572231367745737773777777567677777947966939999991
12365676657565666995654265371111675555657999975656466466664225222979950561
12476777677777776996677265772235677667757775776677777777775361577799504 61
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12764765676466576995765164561124456645657655777566477577777446245559951221
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24444277477777767792621143677774277622627143744444527667762721146769942123
24576767677777776995653166662276576676756765776776554777776221663799527 23
24653667567546674993633664365465275325537564752667642246664634143369952133
24735667567677766775733353767776576556737553767567766576564666266679962853
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25561765466656666993535364677776375345757255744556657447675624165779962133
25666677366566766592636266661157576565727421767446537167444665256676962113
25763767767635766992732341677764573625537533744677334154274426166377962153
25853556556665663993565265367776535524426442644445444444444366235579952833
25956556366575666993753266267762666553617651747664447447644727142579962823
26052472477665677991711543777777176119719452744446656556666761156476742133
26164567577766775693631165676674675645767465766347246347766663176669962743
```

26233666667676676996654366666666566535657665766655555556665563165669952843
26357667677777769935324664544666665666476647666676456566774532464699529 13
26452656456643653993634666567776273555636563644444444444444624144766527 13
26563666566765767992652366677776575564444736744444444444444621165479952713
26653675677556646996733345567776665767725442744554564444445343177779941934
26741467356666644994335345443364665446747641776566543347773552175729942143
26854456334433553995625663654466673554444444644444555456456663266569942713
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27064376467365433991533565167762373331717222772275722722226521666799427 33
27152656467666679995732244467754776764444442744444444444444632155469962113
27254656767667776993633265666664546655627652755655544344444444145659952613
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27555657336565665991653354675562575654727562776666557567665626256379952123
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27996699996669696992622566966659363524444444444444444444444456419556995 2263
28073576677666666993646366677776675737737552777773666744444366167679962243
28164566556556666993644244564674576556666666665665554444444541545699521 13

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Block 19--Abstract

The Australian Department of Defence experiences some difficulty in acquiring the necessary technical data to support defence equipment procured from the U.S. This study undertook to identify the key organizational players in the U.S. military technology transfer system; what difficulties arise for Australia when applying for the transfer of technology; the primary source of the difficulties; and why difficulties arise in the system.

A survey questionnaire was developed to measure the difference in attitudes between U.S. and Australian officials concerning eight proposed constructs which were believed to underlie technology transfer issues.

The statistical findings supported the global alternative hypothesis that there was a significant difference in attitudes between Australian and U.S. officials concerning U.S. technology transfer policy.

These findings generally supported the difficulties identified in the system. These included general complexity of the policy and the technology transfer system; poor interaction between the participating U.S. Government departments; divergent views held by U.S. officials about key policy; de facto policy making by lower level officials; restricted technology transfer reviews undertaken for foreign military sales cases; divergent attitudes about the policy and its implication between U.S. and Australian government officials; and the classified nature of some critical U.S. technology transfer documents.

Recommended action rests primarily with the Australian DoD. Principally, Australia should undertake to educate Australian personnel about U.S. technology transfer policy; the technology transfer system; and the process and its procedures.

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